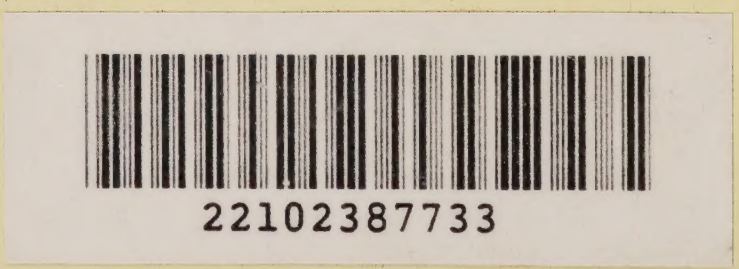
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TRANSACTIONS

OF

THE MEDICAL SOCIETY

OF

LONDON.

VOLUME THE SEVENTEENTH.

EDITED BY

CHARLES BARRETT LOCKWOOD, F.R.C.S.,

AND

AMAND ROUTH, M.D.

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THE present volume comprises the Transactions of the Society during its one hundred and twentieth Session, from October 16th, 1893, to May 7th, 1894, together with a copy of the Laws of the Society as revised and confirmed at a Special General Meeting held July 9th, 1894.

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LAWS

OF THE

MEDICAL SOCIETY OF LONDON.

SECTION I.—THE OBJECTS AND CONSTITUTION OF THE SOCIETY.

1. The Medical Society of London, founded in 1773, has for its objects the advancement of the science and art of Medicine and Surgery, and the cultivation of good fellowship.

2. The Society shall consist of Fellows, Honorary Fellows, and Corresponding Fellows.

3. All British subjects who are registered medical practitioners shall be eligible for nomination as Fellows, as well as Foreigners whose qualifications are satisfactory to the Council.

4. Distinguished members of the medical profession, and persons eminently skilled in other departments of science connected with medicine, shall be eligible for nomination as Honorary Fellows.

5. Members of the medical profession residing abroad, who are not British subjects, shall be eligible as Corresponding Fellows.

6. Whenever in the Laws of the Society the word or words "Honorary Fellow," "Corresponding Fellow," "Fellow," "Candidate," or "Visitor" may occur, such word or words shall signify a person of the male sex only.

SECTION II.—THE ELECTION AND ADMISSION OF FELLOWS.

7. Every Candidate for the Fellowship shall be recommended by three Fellows to whom he is personally known, and shall be elected by ballot.

8. The recommendation shall be read by the Chairman at an Ordinary Meeting, and shall be suspended afterwards in the Library until the next Ordinary Meeting but one, when the ballot shall take place. No Candidate shall be declared elected unless three-fourths of the votes are in his favour, not less than twelve Fellows being present and recording their votes.

9. Each elected Candidate, having paid his entrance fee, shall be admitted at an Ordinary Meeting, when he shall sign the following obligation, viz.:

We, whose names are hereunto subscribed, promise that we will observe and obey the Laws and Regulations of the Medical Society of London, and endeavour to promote its honour, so long as we shall continue Fellows thereof.

The Chairman shall then take him by the hand and say, "In the name and by the authority of the MEDICAL SOCIETY OF LONDON I admit you a Fellow thereof."

10. Candidates residing beyond the limits of the Metropolitan Postal District shall, on election, be furnished with a copy of the obligation, which they shall sign and return to the Honorary Secretary. If unable to attend for admission by the Chairman, such Fellows may be declared admitted at the next ordinary meeting of the Society subsequent to the payment of their entrance fees.

11. Honorary and Corresponding Fellows shall be elected in the same manner as Fellows, except that the recommendation shall be made by the Council. They shall not be entitled to hold office, to vote, or to take part in the management of the Society, or to receive copies of the Transactions.

SECTION III.—THE WITHDRAWAL, REMOVAL, AND RE-ADMISSION OF FELLOWS.

12. A Fellow may withdraw from the Society with the consent of the Council by giving one month's notice to that effect in writing, and paying all moneys due by him to the Society.

13. The expulsion of a Fellow can take place only at a Special General Meeting of the Society, convened by the Council for the consideration of the case; three-fourths, at least, of the votes cast being for the expulsion, and not less than forty votes being recorded. Of such meeting the Council shall give at least fourteen days' notice, by circular, to all the Fellows of the Society. A Fellow thus expelled shall thereby forfeit all claims upon the Society.

14. Fellows who have resigned may be readmitted on their application for that purpose, upon such terms as the Council may think proper.

SECTION IV.—THE CONTRIBUTIONS OF FELLOWS.

15. The Contributions of the Fellows shall be as follow,

	Entrance Fee.	Annual Subscription.
Fellows residing *within* the Metropolitan Postal District	One Guinea.	One Guinea.
Fellows residing *without* the Metropolitan Postal District	One Half-Guinea.	One Half-Guinea.
Corresponding Fellows	Two Guineas.	Nil.
Honorary Fellows	Nil.	Nil.

16. All yearly subscriptions shall be due in advance in October. Fellows elected after the first of March in any year shall not be required to pay their first Annual subscription until the October following.

17. Any Fellow whose subscription is six months in arrear shall be reminded of the same by the Treasurer, and if it be not paid within the following year, the Council shall remove his name from the list of Fellows.

18. *Composition Fees.* The Composition Fees for Subscriptions from Fellows residing *within* the Metropolitan Postal District shall be as follow:—At entrance, Twenty Guineas; after ten Subscriptions have been paid, Fifteen Guineas; after fifteen Subscriptions, Twelve Guineas; after twenty Subscriptions, Ten Guineas; after twenty-five Subscriptions, Five Guineas.

The Composition Fees for Subscriptions from Fellows residing *without* the Metropolitan Postal District shall be half the afore-mentioned rates, viz.—At entrance, Ten Guineas; after ten Subscriptions have been paid, seven and a half Guineas; after fifteen Subscriptions, Five Guineas; after twenty-five Subscriptions, Two and a half Guineas.

All Fellows after forty years' standing shall be exempted from further payments.

19. Fellows who have resigned and who have been permitted to rejoin under Law 14, may commute further subscriptions on paying the Composition Fee which would have been payable at the time of their resignation.

SECTION V.—THE OFFICERS AND COUNCIL OF THE SOCIETY; THEIR ELECTION; THEIR DUTIES.

20. The Officers of the Society, elected from among the Fellows, shall be a President, four Vice-Presidents, a Treasurer, a Librarian, three Secretaries, an Orator, a Lettsomian Lecturer, a Chairman of the House and Finance Committee, and twenty other Fellows of the Society. These, together with the Trustees, constitute the Council.

The President and the Vice-Presidents.

21. The President shall preside at all Meetings of the Society, and shall be an *ex officio* member of all Committees. He shall regulate all the proceedings of the Society, and shall state and put questions, admit Fellows, interpret the application and enforce the

observance of the Laws, check irregularities, decide every doubtful point, and have a second vote when the suffrages are equal. He shall sign the minutes of the meetings, and shall present the thanks of the Society to contributors and donors.

22. Any decision of the President may be referred to the Council on the written demand of five Fellows; such demand to be at once given in, and read from the Chair.

23. In the absence of the President the Chair shall be taken by a Vice-President, or other Member of the Council.

The Treasurer.

24. The Treasurer shall receive all moneys due to the Society, and shall pay them into a bank appointed by the Council. He shall make all payments ordered by the Council by cheque signed by himself and one of the Secretaries in ordinary; he shall keep an account of all such receipts and payments, and shall report the same to the Council at each Monthly Meeting.

25. The Treasurer shall keep a numbered printed receipt book for the entrance fees and subscriptions, in which, on the counterfoil, full particulars shall be entered by the Collector. The Treasurer shall immediately report to the Council the name of any Fellow whose subscription is twelve months in arrear. Receipts shall be signed by the Treasurer and countersigned by the Collector; counterfoils shall be signed by the Collector.

26. The Treasurer shall present, at the first General Meeting in each year, a Report of the Income and Expenditure of the Society during the past year. This Report, as passed by the auditors, shall be laid before the Council at its last meeting (in October).

The Honorary Librarian.

27. The Honorary Librarian shall be *ex officio* a member of the Library Committee, and shall preside at its meetings, which he shall summon as he may think fit. He shall prepare, sign, and present at the second General Meeting a report of the state of the Library, which shall have been previously submitted to the Library Committee.

The Secretaries.

28. There shall be three Secretaries; two in ordinary, and one for Foreign Correspondence.

29. The Secretaries in ordinary shall manage the correspondence of the Society and of the Council. They shall receive all papers intended for the use of the Society. They shall attend every meeting of the Society and of the Council, shall take minutes of the proceedings, read those of the previous meeting, and see that a complete copy of the Laws and a list of the Fellows be on the table. They shall also send notices of Council Meetings to every Councillor, stating the business of the meeting, at least three days beforehand, and shall issue summonses to, and attend all Committee meetings. They shall also send notices of all extraordinary meetings of the Society, or of the Council, and shall transact such other business as the Council may direct. They shall edit the Transactions of the Society.

30. The Secretary for Foreign Correspondence shall write all letters to Corresponding Fellows, or persons resident abroad. He shall provide the Council with translations of any foreign letters or papers received, and with such foreign medical or scientific information as he may see fit, or be required to furnish.

31. The Secretaries in ordinary shall be, *ex officio*, Members of all Committees.

The Orator.

32. The Council shall annually at its meeting in April appoint a Fellow to deliver an Oration on the Monday following the last Ordinary Meeting of the next session, at 8.30 p.m. The Oration may be followed by a Conversazione.

Lettsomian Lecturer.

33. The Council shall annually at its meeting in April appoint a Fellow of the Society to give, in the following session, the course of lectures called the Lettsomian Lectures, not exceeding three in number, on some subject in connection with Medical Science.

34. The Lectures may be given at the Ordinary Meetings, or on such other evenings as the Council may determine.

Chairman of House and Finance Committee.

35. The Chairman of the House and Finance Committee shall be annually elected by that Committee from among its members at its first meeting.

Trustees.

36. The Library, Furniture, Fixtures, Stock in the Public Funds, and all other property of the Society (excepting the Bolt Court Property) shall be invested in the names of at least three Trustees, to be called "The Trustees of the Personal Property," in trust for their respective uses and purposes.

In the name of these Trustees, under the direction of the Council, all leases, agreements, and investments are to be made, with the exception of those referring to the Bolt Court Property.

The Trustees shall not be held responsible for any damage or loss whatsoever which may befall or happen to the books or furniture, or other effects of the Society.

The whole Personal Property is subject to the disposition of the Council, and an extract from the Council Minutes, signed by the President, and countersigned by the Honorary Secretaries, shall be obligatory upon, and full authority for, the Trustees.

37. The Trustees of the Personal Property shall be elected by the Council from among the Fellows of the Society, and the appointment shall require the confirmation of the next General Meeting of the Fellows.

38. Any Fellow holding the office of Trustee, shall, on his resignation of the Fellowship of the Society, or on his removal therefrom, or on his discontinuing to reside within the Metropolitan Postal District, cease to be a Trustee.

39. With all convenient speed after the death, resignation, or disqualification of any of the Trustees of the Personal Property, the Council shall proceed to fill the vacancy.

40. The Trustees of the Bolt Court Property are not subject to Laws 36, 37, 38, and 39.

41. The several Trustees shall be, *ex officio*, Members of the Council.

The Council.

42. The Council shall be elected annually at the Second General Meeting of the Society, and shall take office at the First General Meeting in the October following.

43. The Council shall have the management of the affairs of the Society:—

(*a*) It shall appoint all standing committees at its first meeting, and shall have power to appoint at any time any special committee that it may think desirable, and to appoint on such committees any Fellow of the Society whether a member of the Council or not.

(*b*) It shall appoint the Lettsomian Lecturer and the Orator, for the following Session, at its meeting in April; the Trustees of the Personal Property, the Registrar, and the Collector, as the offices fall vacant.

(*c*) It shall appoint all paid officials of the Society, fix their duties, and suspend or remove them when it sees fit.

(*d*) It shall also administer and manage the Fothergillian Fund subject to, and in conformity with, the provisions of the scheme approved by the Charity Commissioners under date 12th June, 1891 (see Appendix A).

(*e*) The Council shall annually present, at the second General Meeting, a report on the state of the Society.

(*f*) It shall be the duty of the Council at its meeting in April, to prepare a balloting list in accordance with Law 49.

(*g*) The Council shall have power to award a medal for any special services rendered to the Society by a Fellow.

44. The Council shall meet on the fourth Monday in October, November, January, February, March, April, and June, and shall hold its last meeting in the October following, previous to the First General Meeting.

All other meetings shall be deemed to be special, and shall be held on the requisition of the President or any three of its members.

45. Each member of the Council shall, on entering the Council Room and before taking part in the proceedings, sign his name in the book kept for that purpose, and this shall be taken as the sole evidence of his attendance.

46. At each ordinary or special meeting of the Council, a quorum shall consist of not less than five members.

47. The President shall be the Chairman, or in his absence, one of the Vice-Presidents, or, in their absence, some other member of the Council who shall be elected by a majority of those present at that meeting.

48. The proceedings of the Council shall be recorded in a Minute Book.

Election of Officers and Council.

49. The balloting list shall consist of three columns—one containing the names of present Officers and Members of the Council, denoting those who are ineligible for re-election; a second containing a list of Fellows recommended for office by the Council; and a third with blank spaces, in any of which Fellows may write the name of a Fellow they may select for office in the place of the corresponding name recommended by the Council; provided such name have been forwarded to the Secretaries at the Society's House at least six clear days previous to the date of the ballot, together with the names of the proposer and seconder. It shall be the duty of the senior Secretary to see that the name of such candidate, with the office for which he is nominated, together with the names of his proposer and seconder, is sent to all Fellows at least three clear days before the Second General Meeting. Only such names in addition to those nominated by the Council shall be eligible.

50. A special summons, enclosing the Balloting List, shall be sent to each Fellow at least ten clear days before the meeting of the Society at which the election of Officers and Council takes place.

51. At the Second General Meeting the President shall take the Chair at 8 p.m., and shall immediately declare the ballot open, and shall appoint three scrutineers whose duty shall be to take charge of the ballot-box until the close of the ballot at 9 p.m., when they shall examine the votes recorded and report the result to the President for announcement to the Meeting. Every Fellow balloting shall give his name to the scrutineers and afterwards deposit his list in the ballot-box; but should any Fellow be unable to attend personally, he may return his list (which must not be signed), enclosed in a sealed envelope with his name inscribed therein, and marked "Ballot" on the outside to the President at the Society's house on or before the day of election. The President or the scrutineers shall deposit this list in the ballot-box.

52. In the event of an equality of votes the President shall have a second or casting vote.

53. The President, the two senior Vice-Presidents, and the ten Councillors who have attended the fewest meetings of Council, shall not be eligible for re-election for one year.

54. No Officer or Councillor (except the Trustees, the Treasurer, the Honorary Librarian, and the Chairman and members of the House and Finance Committee) shall hold the same office for more than three years consecutively.

55. The Council shall have the power of filling up any vacancies occurring in the Council between the General Meetings.

SECTION VI.—THE MEETINGS.

56. The Ordinary Meetings of the Society shall be held on the *second* and *fourth* Mondays in each month from the *second* Monday in October to the *second* Monday in May inclusive, the *fourth* Monday in December excepted. Prior to the Ordinary Meetings on the *second* Monday in October and the *second* Monday in May General Meetings of the Fellows shall be held, which shall respectively be called the First and Second General Meetings of the Society.

57. All other Meetings of the Society shall be Special General Meetings, at which no resolution or amendment shall be con-

sidered carried unless at least three-fourths of the votes of those present are in favour of such resolution or amendment. Any resolution carried at a Special General Meeting shall require to be confirmed at another Special General Meeting, at which a bare majority shall confirm the resolution passed at the First Special General Meeting. The Second Special General Meeting must be held not less than *seven*, and not more than *twenty-one* days after the First Special General Meeting. At such Special General Meetings not less than twenty Fellows shall form a quorum, except in case of Meeting under Law 13.

58. Special General Meetings may be convened by the President and Council at any time.

Not less than twenty Fellows shall have the right of calling a Special General Meeting on signed requisition to the President.

59. At least seven clear days' notice of any Special General Meeting shall be sent to each Fellow of the Society, stating the matters to be considered, except in case of Meeting under Law 13.

60. The Anniversary Meeting of the Society shall be held on the 8th March, except it fall on a Sunday or Monday, when it shall be kept on the Saturday next before that date; and shall be celebrated by a Dinner to be held at such time and place and with such notice, as the Council may determine.

Procedure at General Meetings.

61. The General Meetings shall begin at 8 p.m. and the business shall be conducted in the following order:—

At the First General Meeting (October) :—

(1) The Treasurer's Report and Balance Sheet, as passed by the Auditors, for the year ended 30th September, shall be presented, and a printed copy thereof distributed to the Fellows present at the Meeting.
(2) The President shall vacate the Chair, and the new Officers shall commence their duties.
(3) The new President shall deliver an address.

At the Second General Meeting (May) :—

(1) The Officers and Council shall be elected for the year commencing in October following.

(2) Reports on the state of the Society shall be presented by the Council; of the Library, by the Honorary Librarian; and of the buildings and other assets of the Society, by the Chairman of the House and Finance Committee.

(3) Alterations of, or additions to, the Laws of the Society may be made (*v.* Section IX).

(4) Two Auditors to audit the Balance Sheet for the year ending the 30th September following shall be appointed.

The proceedings of the General Meetings shall be entered in a special minute book.

Procedure at Ordinary Meetings.

62. The Ordinary Meetings shall begin at 8.30 p.m., and the business shall be conducted in the following order :—

(1) The minutes of the last meeting shall be read and confirmed.

(2) Candidates proposed at the last meeting but one shall be balloted for.

(3) Recommendations of Candidates shall be read, and notice of the date of the ballot for their election shall be given.

(4) Elected candidates who have complied with Law 9 shall be formally introduced to and admitted by the Chairman.

(5) Candidates elected under Law 10 shall be declared admitted by the Chairman.

(6) Gifts to the Society shall be announced.

(7) The names of Visitors admitted for the evening shall be announced from the Chair. They may be invited to take part in the discussion.

(8) Communications to the Society shall be made, and in such order as the Chairman may direct.

(9) The titles of the communications to be made at the next meeting shall be announced.

(10) At ten o'clock precisely the Chairman shall close the Meeting, unless a special resolution be passed to continue the discussion for a period not exceeding half-an-hour, or to adjourn it to a day and hour to be agreed upon by the Meeting.

63. Each Fellow shall, before entering the Meeting Room, sign his name in a book kept for that purpose. He may introduce two Visitors at each Ordinary Meeting and at the First General Meeting, on entering their names in the Visitors' Book. No Visitor shall be admitted more than twice during the Session, unless by the permission of the Chairman.

64. Communications to the Society shall relate to Medicine, Surgery, or some branch of science connected therewith, and shall not exceed in length what may be read in twenty minutes. They shall be read either by the author or by one of the Secretaries, and the Fellows shall be at liberty to make observations thereon. The Council may set apart certain Ordinary Meetings to be called "Clinical Meetings" for the demonstration of cases of interest.

65. Notice of a proposed communication must be given to one of the Secretaries in ordinary. The President shall have power to refer any proposed paper to the Committee of Referees for a report as to its suitability; but an adverse report shall not be acted upon except by order of the Council. Whenever practicable a short abstract of communications and some account of their nature shall be suspended in the Library prior to their being read.

66. The discussions at the Ordinary Meetings shall be strictly confined to the communications of the evening. All matters relating to appeals, the expulsion of Fellows, or other extraordinary business, shall be transacted only at Special General Meetings.

67. No Fellow shall be entitled in a discussion to speak more than once, except in explanation, or for a longer time than ten

minutes; but the author of a communication shall have a right to reply.

68. A copy of the Statutes and the Insignia of the Society shall lie on the table, before the President, at all meetings.

69. When the determination of the Society is required on a question, it shall be taken by ballot, if so demanded by any Fellow.

70. All questions, excepting those for which it is otherwise provided, shall be determined by a majority of the Fellows present.

71. Whenever in these laws the date of any Meeting shall fall on a Bank Holiday, the Council shall have power to alter the date of such Meeting.

SECTION VII.—COMMITTEE OF REFEREES ON COMMUNICATIONS AND PUBLICATIONS.

72. Fifteen Fellows of the Society shall be annually appointed by the Council to constitute a Committee of Referees, who shall, when requested by the President, report confidentially to the Council on the suitability of any of the communications offered to the Society, and shall also, when similarly requested, report as to the desirability of publishing a communication in the Transactions.

SECTION VIII.—THE SOCIETY'S TRANSACTIONS.

73. The Transactions of the Society, under the designation of Transactions of the Medical Society of London, shall be printed at such times and in such a manner as the Council shall direct.

74. Each Fellow of the Society shall be entitled to receive, gratis, one copy of each volume of the Transactions which may be published subsequently to his admission as a Fellow, provided his subscription be not more than three months in arrear.

SECTION IX.—THE MAKING AND REPEALING OF LAWS.

75. New Laws shall be enacted and old ones repealed or altered, only at the Second General Meeting of the Society, or at such Special General Meeting as shall be summoned for the purpose.

All proposed changes in the Laws shall be suspended in the Library for the inspection of the Fellows, from the time of the issuing of the summons of the meeting at which it is intended to submit such proposed changes.

76. No alteration of the Laws at the Second General Meeting shall be valid unless three-fourths of the Fellows voting ballot in its favour; not less than twenty Fellows being present and recording their votes.

SECTION X.—SALARIED OFFICIALS.

77. The salaried officials shall not be Fellows of the Society.

The Registrar.

78. The Registrar shall be appointed by the Council, who shall regulate his duties and fix his salary. He shall have charge of the Library under the direction of the Honorary Librarian.

The Collector.

79. The Collector shall be appointed by the Council, and shall receive a poundage upon all subscriptions collected by him. He shall be under the direction of the Treasurer, and shall give such securities to the Trustees for the performance of his duties as shall be satisfactory to the Council.

80. He shall give to the Treasurer, previously to the meetings of the Council, an account of his receipts, and shall pay in to the Society's Bank at the end of every week the money received by him for the Society. He shall also furnish half-yearly to the Treasurer a list of Fellows whose subscriptions are more than six months in arrear.

SECTION XI.—THE LIBRARY AND LIBRARY COMMITTEE.

81. The care and management of the Library shall be immediately under the Resident Librarian (Registrar), who shall be subject to the Honorary Librarian and the Library Committee.

82. The Library Committee shall consist of the Honorary Librarian and five Fellows of the Society appointed by the Council in accordance with Law 43*a*.

83. The Committee shall meet as often as required by the Honorary Librarian, or on the requisition of any two members of the Committee, addressed to the Honorary Librarian.

The duties of the Committee shall be :—

(1) The purchase of books and periodicals.

(2) The general management of the Library, and the framing of such regulations as may be required from time to time for the conduct of the same. A copy of such regulations, after approval by the Council, shall be suspended in the Library.

84. The proceedings of the Committee shall be recorded in a special Minute Book, which shall be presented at meetings of the Council of the Society whenever required.

85. Donations to the Library shall be acknowledged by the Honorary Librarian in the name of the Council, and a list of all works given to the Library shall be appended to the Honorary Librarian's Annual Report.

86. The Library shall be open daily for the purpose of reading, and for issuing books on loan, from 1 to 6 p.m., except on Saturdays, when it shall be closed at 3 p.m. On Sundays, Bank Holidays, and for such period between the first day of August and the last day of September as the Honorary Librarian may determine, the Library shall be closed.

87. Every Fellow shall be entitled to borrow books from the Library, and may have eight volumes or pamphlets or periodicals in his possession at the same time.

88. The Librarian shall enter in a book, kept for that purpose in the Library, the titles of any works borrowed by a Fellow, who shall thereto affix his signature, countersigned by the Librarian. Non-resident Fellows may ask in writing for any works they may require, and shall pay all costs incurred in their transmission from and to the Library.

89. When a book, pamphlet, or periodical which has been a fortnight in the possession of a Fellow is wanted, the Librarian shall send him a notice requesting the return of it; and a fine of sixpence shall be incurred for every day that it may be detained after the third from the transmission of such notice; and until the return of such work or works and the payment of all fines incurred through delay, no further issue of books shall be permitted to the Fellow in question.

90. Every Fellow who borrows books from the Library shall be answerable for the full value of any that may be lost or injured.

91. All books shall be ordered in for inspection at such times as the Honorary Librarian may appoint, and a fine of five shillings per volume shall be incurred by any Fellow neglecting to send in books by the time stated in the notice.

92. A book shall lie on the Library table, in which Fellows may insert, for the consideration of the Library Committee the titles of such works as they recommend for purchase by the Society.

93. The Council shall have the power to collect the fines as it may think best.

SECTION XII.—HOUSE AND FINANCE COMMITTEE.

94. The House and Finance Committee shall consist of the President, the Trustees of the Personal Property, the Treasurer, and the

Secretaries in ordinary *ex officio*, and of not less than five other Fellows of the Society, who shall be appointed by the Council and may hold office for a period not exceeding five years.

95. This Committee shall be entrusted, subject to the control of the Council, with the management of all matters relating to the Society's leasehold property and buildings in Chandos Street.

96. The Chairman, elected in accordance with Law 35, shall be the Executive Officer of the Committee.

97. The Committee shall inspect the buildings under its charge at least once a year.

98. The Committee shall prepare an Annual Report on the state of the buildings and other assets of the Society for presentation to the Society at its Second General Meeting; the Report having been previously submitted to the Council.

99. The proceedings of the Committee shall be recorded in a special minute book and shall be read at the next meeting of the Council.

APPENDIX A.

The Fothergillian Gold Medal.

The following Scheme has been approved and established by the Charity Commissioners for the regulation of the Trust :—

Scheme.

1. From and after the day on which this Scheme is approved and established by an Order of the Charity Commissioners, the above-mentioned Charity and the endowment specified in the Schedule hereto, and all other endowments (if any) of the said Charity, shall be administered and managed by the Council of the Medical Society of London, hereinafter called the Trustees, subject to and in conformity with the provisions of this Scheme, under the title of the Fothergillian Fund.

2. Any sum of Stock comprised in this Scheme shall be forthwith transferred, under the authority of a further Order of the Charity Commissioners, into the name of "The Official Trustees of Charitable Funds."

3. All the proper costs, charges, and expenses of and incidental to the administration and management of the Charity shall be first defrayed by the Trustees out of the income thereof.

4. Subject to the payments aforesaid, the yearly income of the Charity shall be applied by the Trustees in providing a prize to be awarded once in three years, and of a value not exceeding Sixty Guineas. Such prize may be awarded either in the shape of a medal or an honorary premium (which may include a money payment), or in both of those ways.

The prize shall be awarded to a British subject, either for the best essay on some branch of Practical Medicine or Practical Surgery proposed by the Trustees, or for a literary work on some branch of Practical Medicine or Practical Surgery published within a period of five years prior to the award of the prize.

The prize shall be awarded upon a report of a committee consisting of five members of the said Medical Society of London, together with the President for the time being of the Royal College of Physicians, or some Fellow of the said College deputed by him. Four members of the committee shall form a quorum.

5. The remaining portion of the income of the Charity, together with any portion of the aforesaid sum of Sixty Guineas which may not be required for the purpose aforesaid, shall be triennially applied in the purchase of books of a medical or other scientific character for the library of the said Society.

6. No Trustee acting in any capacity in respect of the Charity shall receive any salary or remuneration from the funds of the Charity.

7. Any question as to the construction of this Scheme, or as to the regularity or the validity of any acts done or about to be done under this Scheme, shall be determined conclusively by the Charity Commissioners, upon such application made to them for the purpose as they think sufficient.

SCHEDULE OF PROPERTY.

Description.	Amount.	Persons in whose Names invested.	Gross Yearly Income.
	£ *s.* *d.*		£ *s.* *d.*
New Consols	916 10 5	"The Official Trustees of Charitable Funds."	25 4 0

Sealed by Order of the Board this 12th day of June, 1891.

G. H. GAUNTLETT,
Authorised under 50 *&* 51 *Vict., c.* 49, *sec.* 3

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1889. Jonathan Hutchinson, F.R.S.
1890. Arthur Ernest Sansom, M.D.
1891. Sir Joseph Lister, Bart., F.R.S.
1892. Sir James Crichton Browne, M.D., F.R.S.
1893. W. Mitchell Banks.
1894. William M. Ord, M.D.

THE FOTHERGILLIAN GOLD MEDALLISTS.

1787. William Falconer, M.D.
1790. Robert Willan, M.D.
1791. John Coakley Lettsom, M.D.
1795. John Mason Good.
1801. Francis Bouttatz, M.D.
1803. Edward Jenner, M.D.
1824. Robert W. Bampfield.
1828. John George Parry.
1831. William Augustus Guy.
1834. William James Clement.
1835. George Moore.
1836. Thomas Egerton Bryant.
1838. George Pilcher.
1840. Samuel Osborn.
1842. James Risdon Bennett, M.D.
1843. John Weaver Lever, M.D.
1844. Henry Pratt Robarts.
1845. Walter Cooper Dendy.
1846. Robert Mortimer Glover, M.D.
1847. Silas Stedman.
1849. John Milligan.
1850. Richard Payne Cotton, M.D.
1851. Richard Hodges.
1852. Frederick William Headland.
1853. Alfred William Poland.
1854. Benjamin Ward Richardson, M.D.
1856. William Burke Ryan.
1857. Edwin Canton.
1858. Thomas Herbert Barker, M.D.
1859. Alderman Thomas Houghton Waters.
1868. John Clay.
1870. Thos. Smith Clouston, M.D.
1872. Edwards Crisp, M.D.
1873. John Kent Spender, M.D.
1877. Peter Murray Braidwood M.D.
1878. John Milner Fothergill, M.D.
1882. Thomas Michael Dolan, M.D.
1883. Norman Porritt.
1886. John Strahan.
1888. Hobart Amory Hare, M.D., U.S.A.
*1893. William Richard Gowers, M.D., F.R.S.

* *First Triennial Award under the Charity Commissioners' New Scheme*, vide *Trans., vol. xiv, p. xi.*

THE HONORARY FELLOWS.

1893. Barnes, Robert, M.D., Lingwood, Liss, Hants, LL, C.

1876. Barnes, J. K., M.D., Surgeon-General U.S. Army, Washington.

1881. Billings, John S., M.D., Washington, Surgeon to the United States Army; Librarian to the Surgeon-General's Library, Washington.

1894. Catrin, Louis, M.D., Médecin-major de première classe, Professeur agrégé à l'Ecole du Val-de-Grace, Paris.

1873. Chauveau, A., Professor of Physiology at the Medical School of Lyons.

1890. Crudeli, Tommasi, M.D., Rome.

1881. Da Costa, J. M., M.D., Professor of Medicine in the Jeffreson Medical College, 1700, Walnut-street, Philadelphia.

1881. Emmet, Thomas Addis, M.D., 89, Madison-avenue, Surgeon to the Woman's Hospital of the State of New York.

1886. Gairdner, Sir William Tennant, M.D., LL.D. Edin., F.R.C.P. Edin., F.R.S., 225, St. Vincent-street, Glasgow.

1881. Halla, Joseph, Professor of Medicine in the University of Prague.

1869. Hare, Charles John, M.D., Berkeley House, Manchester-square, W., Consulting Physician to University College Hospital, and late Professor of Clinical Medicine in University College. P, VP 2. C 8, LL. *Trustee.*

1890. Holmgren, Frithiof, Professor, Upsala.

1883. Humphry, Sir George Murray, M.D., F.R.S., Professor of Surgery in the University of Cambridge. O, C 2.

1873. Huxley, The Right Honourable Thomas Henry, LL.D., F.R.S., Hodeslea, Eastbourne, Professor of Biology in the Normal School of Science and in the Royal School of Mines.

1875. Jenner, Sir William, Bart., K.C.B., D.C.L., LL.D., M.D., F.R.S., Greenwood, Durley, Hants, Physician-in-Ordinary to H.M. the Queen and to H.R.H. the Prince of Wales; late President of the Royal College of Physicians; Emeritus Professor of Clinical Medicine in University College, London; Consulting Physician to University College Hospital.

1890. Kocher, Theodor, Professor, Berne.

1884. Larrey, Baron, M.D., Paris, Rue de Lille, 91.

1883. Le Roy de Mericourt, A., M.D., Paris.

1890. Lombard, Henri-Clermond, M.D., Geneva.

1878. Mitchell, S. Weir, M.D., Walnut-street, Philadelphia.

1881. Nussbaum, John Nepomuk Ritter von, M.D., Professor of Surgery in the University of Munich.

1875. Ollier, Professor, Lyons.

1873. Paget, Sir James, Bart., D.C.L., LL.D., F.R.S., 1, Harewood-place, Hanover-square, W., Serjeant-Surgeon to H.M. the Queen; Surgeon to H.R.H. the Prince of Wales; Consulting Surgeon to St. Bartholomew's Hospital.

1876. Pancoast, Joseph, M.D., 1030, Chesnut-street, Philadelphia, Professor of Anatomy in the Jeffreson Medical College.

1890. Pasteur, Louis, Member of the Institute of France, Paris.

1877. Sanné, A., 12, Place de Laborde, Paris.

1881. Tarnier, Stephanie, M.D., Professor of Obstetric Medicine in the School of Medicine, Paris.

1881. Verneuil, Auguste Aristide, M.D., Professor of Medicine in the School of Medicine, Paris.

1873. Virchow, Rudolph, M.D., Professor of Pathological Anatomy in the University of Berlin.

CORRESPONDING FELLOWS.

1851. Albaro, J. Mendez, Madrid.
1882. Badaloni, Giuseppe, M.D., Fano, Prov. di Pesaro, Italy.
1856. Baker, Albert, M.D., The Laurels, Pinhoe, Exeter.
1855. Beardsley, Amos, Bay Villa, Grange, Lancashire.
1850. Benavente, Mariano, Madrid.
Beneke, F. W., M.D., New York.
1850. Böhm, Professor, M.D., Vienna.
Bottini, Giuseppe, M.D., Milan.
1837. Buhring, J. J., M.D., Berlin.
Cade, Thomas Charles, Spondon, Derby.
1855. Coates, Charles, M.D., F.R.C.P., 10, Circus, Bath, Consulting Physician to the Bath Royal United Hospital. c 3.
1850. Cox, William Isidore, Hawkesbury, Upton, Gloucestershire. c.
1876. De Muynck, J., M.D., Ghent.
1836. Ecstein, Sigismund, M.D., Vienna.
Eylandt, Johann Emil, M.D., Curland, Russia.
1853. Fallot, R., M.D., St. Laurent d'Aigonze, Montpelier, France.
1889 Frank, Philip, M.D., F.R.C.P., Cannes, France.
1876. Griffith, Richard Glyn, Allahabad, India.
1864. Hasenfeld, Emmanuel, M.D., Pesth.
Hyman, —, M.D., Antwerp.
1851. Izguierdo, Sebastian Obtega, Madrid.
1875. Jones, Philip Sydney, M.D., F.R.C.S., Examiner in Medicine in the University of Sydney, Australia, Hon. Consulting Surgeon to the Sydney Infirmary.
1861. Journez, Henri, M.D., 43, Rue de la Charité, Bruxelles, Belgique.
1851. Kölliker, Albert, M.D., Professor of Anatomy and Physiology at the University of Wurzburg.
1876. Leighton, Walter H., M.D., Lowell, Massachusetts, U.S.
Leon, Jose, Madrid.
1851. Llanos, Antonio Campo, Madrid.
1851. Lovera, Jose, Madrid.
1851. Marino, Bonifacio Matreos, Madrid.
Mendez, Bartholome, Madrid.
Molina, M. M., Madrid.

1851. Negri, Gaetano, M.D., Pisa.
Ortega, J. R., Madrid.
1865. Peruzzi, Domenico, M.D., 22, Via Mazzini, Bologna.
1882. Restrepo, Alessando Eduardo, M.D., Medillin, Columbia, U.S.A.
1886. Rocha, A., M.D., Coimbra, Beira, Portugal.
1860. Roussel, M.D., Dean of the Faculty of Medicine, Montpelier.
Scharlan, Gus. W., M.D., Stettin, Prussia.
1876. Schmitz, Richard, M.D., Neuenahr.
1874. Schutgowsky, J., St. Petersburg.
1851. Sesse, M., Mesqui, Madrid.
Stockwell, Thomas Goldesbrough, F.R.C.S., 6, Circus, Bath, Surgeon to the Bath Royal United Hospital.
Tereza, Felix Garcia, Madrid.
Valdez, Franco Cortigo, Madrid.
Williams, Charles, F.R.C.S. Edin., 48, Prince of Wales-road, Norwich; Surgeon to the Norfolk and Norwich Hospital.

THE FELLOWS

OF

THE MEDICAL SOCIETY OF LONDON.

Explanation of Abbreviations.

P.—President.	FM.—Fothergillian Gold Medallist.
VP.—Vice-President.	SM.—Silver Medallist.
T.—Treasurer.	O.—Orator.
L.—Librarian.	CFC.—Chairman, House and Finance Committee.
S.—Secretary.	§—Sec. for Foreign Correspondence.
C.—Councillor.	*—Life Members.
LL.—Lettsomian Lecturer.	Tr.—Trustee.

The number prefixed signifies the date of election. The figures appended indicate the number of Sessions served, and refer to past appointments ONLY.

1890. Abbot-Anderson, William Maurice, M.B., 10, Old Cavendish-street, Cavendish-square, W.
1888. Abbott, Charles Edward, M.R.C.S., Shrapnels, Taunton.
1891. Abraham, Phineas S., M.D., 2, Henrietta-street, Cavendish-square, W.
1890. Ackland, Robert Craig, M.R.C.S., 13, Savile-row, W.
1883. Acland, Theodore Dyke, M.D., 74, Brook-street, Grosvenor-square, W. c.
1884. Adam, James, M.D., Malling-place, West Malling, Kent.
1889. Adams, James, M.D., 4, Chiswick-place, Eastbourne.
1878. Adams, Josiah Oake, M.D., Brook House, Upper Clapton, E.
1852. *Adams, William, F.R.C.S., 5, Henrietta-street, Cavendish-square, W. p, c 8, o, vp 3, ll.
1878. *Allchin, William Henry, M.D., F.R.S.E., 5, Chandos-street, Cavendish-square, W. vp 2, *Hon. Librarian.*
1873. Allen, Henry Marcus, F.R.C.P. Edin., 20, Regency-square, Brighton.
1873. Allfrey, Charles Henry, M.D., Plas Newydd, St. Leonards-on-Sea.
1883. Allingham, Herbert W., F.R.C.S., 25, Grosvenor-street, W. c 3.
1872. *Allingham, William, F.R.C.S., 25, Grosvenor-street, W. c.
1860. Althaus, Julius, M.D., 48, Harley-street, W. c 5, § 3.

1885. Anderson, John, M.D., C.I.E., 9, Harley-street, W.
1889. Anderson, William, F.R.C.S., 2, Harley-street, W. *Councillor.*
1888. Andrewes, Frederick William, M.B., 35, Welbeck-street, W.
1869. Armitage, Samuel Harris Tatham, M.D., 39, Grosvenor-street, W.
1894. Ashe, William Percy, M.R.C.S., 41, Sloane-gardens, S.W.
1873. Atkinson, Edward, M.R.C.S., 93, Albion-street, Leeds.
1892. Ayres, Charles James, M.D., 47A, Welbeck-street, W.

1873. Bagshawe, Frederic, M.D., 35, Warrior-square, St. Leonards-on-Sea. c.
1871. Bailey, George Hewlett, M.R.C.S., 43, Queen Anne-street, W.
1892. Bailey, Henry Frederick, M.R.C.S., The Hollies, Lee-terrace, Lee, S.E. c. *Councillor.*
1894. Bailey, Robert Cozens, M.S., 2, Museum-chambers, Bury-street, W.C.
1891. Baily, Percy J., M.B., County Asylum, Hanwell, W.
1876. *Baker, Henry Francis, F.R.C.S. Edin., 2, Mandeville-place, Manchester-square, W. c.
1890. Baker, William Henry, M.R.C.S., 40, Norfolk-terrace, Bayswater, W.
1891. Ball, James Barry, M.D., 12, Upper Wimpole-street, W.
1881. Ballance, Charles Alfred, M.S., 106, Harley-street, W. s 2, c 3.
1884. Banks, W. Mitchell, F.R.C.S., 28, Rodney-street, Liverpool. o. *Councillor.*
1859. Barnes, John Wickham, F.R.C.S., 3, Bolt-court, E.C. s 2, vp, c 3.
1883. *Barnes, Robert, M.D., *Honorary Fellow* (*q. v.*).
1874. Barrett, Howard, M.R.C.S., 49, Gordon-square, W.C. *Councillor.*
1884. Barrow, Albert Boyce, F.R.C.S., 37, Wimpole-street, W. c.
1886. Barwell, Richard, F.R.C.S., 55, Wimpole-street, W.
1884. Bateman, Frederick Augustus Newton, M.R.C.S., 4, Charles-street, St. James's-street, S.W.
1886. Batterham, John Williams, M.B., Bank House, Grand-parade, St. Leonards-on-Sea.
1888. Battle, William Henry, F.R.C.S., 2, Mansfield-street, W.
1882. Beach, Fletcher, M.B., Winchester House, Kingston-hill, Surrey, and 64, Welbeck-street, W. c.
1887. Beale, Edwin Clifford, M.B., 23, Upper Berkeley-street, W.
1891. Beale, Peyton T. B., F.R.C.S., 61, Grosvenor-street, W.
1880. Beevor, Charles Edward, M.D., 33, Harley-street, W. s 2, c. *Trustee.*
1889. Beevor, Sir Hugh Reeve, Bart., M.D., King's College-chambers, Strand, W.C.
1887. Benham, Frederick Lucas, M.D., 93, Elizabeth-street, Eaton-square, S.W.
1881. Bennet, Robert Ottiwell-Gifford, M.D., Tankerville House, Park-place, Buxton.
1883. Bennett, William Henry, F.R.C.S., 1, Chesterfield-street, Mayfair, W. *Councillor.*

1887. Berry, James, F.R.C.S., 60, Welbeck-street, W.
1893. Betts, Frederick Bernard, M.R.C.S., 63, The Chase, Clapham Common, S.W.
1873. Beveridge, James Spowart, M.R.C.P. Edin., Lochinver, Lairg, N.B.
1890. Bidwell, Leonard Arthur, F.R.C.S., 59, Wimpole-street, W.
1868. Bird, George, M.D., 49, Welbeck-street.
1888. Bird, Matthew Mitchell, M.D., St. Mary's Hospital, W.
1850. *Birkett, John, F.R.C.S., 62, Green-street, Grosvenor-square, W. vp, c 6.
1883. Biss, Cecil Yates, M.D., 135, Harley-street, W.
1889. Bisshopp, Francis Robert Bryant, M.B., Belvedere, Lonsdale-gardens, Tunbridge Wells.
1886. *Black, William Gall, F.R.C.S., 2, George-square, Edinburgh.
1885. Blake, John Ffrench, 33, Chelverton-road, Putney, S.W.
1881. Blaker, Walter Campbell, Bognor, Sussex.
1888. Blanc, Leon, M.D., Aix les Bains, France.
1871. *Bloxam, John Astley, F.R.C.S., 75, Grosvenor-street, W. vp 2, s 2, c 3.
1867. Bond, Thomas, F.R.C.S., 7, The Sanctuary, Westminster, S.W. c.
1879. Bott, Henry, M.R.C.S., Brentford, Middlesex.
1872. Boulton, Percy, M.D., 6, Seymour-street, Portman-square, W. c.
1886. Bourns, Newcome Whitelaw, M.D., 78, Redcliffe-gardens, S.W.
1886. Boustead, Robinson, M.D. (Brigade Surgeon), 45, Pall Mall, S.W.
1889. Bowles, Robert Leamon, M.D., 16, Upper Brook-street, W.
1883. Bradshaw, James Dixon, M.B., Savile Club, Piccadilly.
1868. Braidwood, Peter Murray, M.D., Coleshill, Amersham, Bucks. f.m., 1877.
1869. Braine, Francis Woodhouse, F.R.C.S., 67, Wimpole-street, W. vp 2, s 2, c 3, sm.
1889. Braine, C. Carter, F.R.C.S., 67, Wimpole-street, W.
1876. Brewer, Alexander Hampton, 136, Richmond-road, Dalston, E.
1873. Bridgwater, Thomas, M.B., LL.D., Harrow, Middlesex. c.
1887. Bristowe, John Syer, M.D., F.R.S., 13, Old Burlington-street, W. p, ll. *Councillor.*
1893. Broadbent, John Francis Harpin, M.B., 84, Brook-street, W.
1862. Broadbent, Sir William Henry, Bart., M.D., 84, Brook-street, W. p, vp, o, ll, c 4.
1890. Brook, William Frederick, F.R.C.S., Mount Pleasant, Swansea.
1879. Brookfield, John Storrs, M.D., 2, Devonshire-villas, Brondesbury, N.W.
1878. Brooks, Job Edwin, 54, Mill-street, Ludlow, Salop.
1878. Brown, Andrew, M.D., Elton Villa, 1, Bartholomew-road, Kentish Town, N.W.
1871. Brown, John, St. Levan's, 28, Lavender-gardens, Lavender-hill, S.W.
1889. Browne, George Buckston, M.R.C.S., 80, Wimpole-street, W. c. *Councillor.*

1871. Browne, Sir James Crichton, M.D., F.R.S., 61, Carlisle-mansions, S.W. o, c.
1873. Browne, Lennox, F.R.C.S. Edin., 15, Mansfield-street, Portland Place, W.
1887. Bruce, John Mitchell, M.D., 70, Harley-street, W.
1873. Brunjes, Martin, M.R.C.S., 33a, Gloucester-place, Bryanston-square, W.
1862. Brunton, John, M.D., 21, Euston-road, N.W. vp, c 2.
1874. *Brunton, Thomas Lauder, M.D., F.R.S., 10, Stratford-place, W. ll, vp, c 4, sm.
1850. *Bryant, Thomas, F.R.C.S., 65, Grosvenor-street, W. p, vp, ll, s 2, c 4. *Trustee.*
1858. Buchanan, Sir George, M.D., F.R.S., 27, Woburn-square, W.C. p, ll, vp, o, c 3.
1885. *Bunny, J. Brice, M.R.C.S., Newbury, Berks.
1872. Burger, Alexander, M.D., 10, Finsbury-square, E.C.
1890. Butler, Patrick, L.K.Q.C.P., 22, Duke-street, Portland-place, W.
1886. Butler-Smythe, Albert Charles, F.R.C.S., 76, Brook-street, W.
1872. Byas, Edward Hegley, M.R.C.S., 10, Cambridge-gate, Regent's Park, N.W.

1886. Cahill, John, F.R.C.S., 12, Seville-street, Lowndes-square, Hyde Park, S.W. c. *Councillor.*
1892. Caldwell, Robert, F.R.C.S., Surgeon Captain, care of Messrs. Holt and Co., 17, Whitehall-place, S.W.
1893. Caley, Henry Albert, M.D., 24, Upper Berkeley-street, W.
1891. Calvert, James, M.D., 36, Queen Anne-street, W.
1888. Campbell, Charles M., M.D., *Travelling.*
1892. Cargill, Lionel Vernon, F.R.C.S., Royal Eye Hospital, St. George's-circus, S.E.
1892. Carless, Albert, F.R.C.S., 10, Welbeck-street, W.
1889. Carnall, Edward, M.R.C.S., 9, Gerrard-street, W.
1882. Carpenter, Arthur Bristowe, M.B., 34, Dingwall-road, Croydon.
1889. Carr, John Walter, M.D., 40, Bloomsbury-square, W.C.
1871. Carter, Robert Brudenell, F.R.C.S., 31, Harley-street, W. p, vp, o, ll, c 4.
1889. Cartwright, Alexander, M.R.C.S., 32, Old Burlington-street, W.
1876. Cartwright, S. Hamilton, 45, Albert-gate, Hyde-park, W.
1878. Cassidy, Joseph Lamont, M.D.
1876. *Cathcart, Samuel, M.R.C.P. Edin., Prudhoe House, High-road, Tottenham, E.
1889. Cautley, Edmund, M.B., 15, Upper Brook-street, W.
1882. Cavafy, John, M.D., 2, Upper Berkeley-street, W. c 3.
1891. Chaplin, T. H. Arnold, M.B., 24, Finsbury-circus, E.C.
1867. Chapman, John, M.D., Avenue de l'Opera 31, Paris.

1885. Chasseaud, William, M.D., Smyrna, Asia Minor.
1889. Cheyne, Watson, F.R.C.S., F.R.S., 75, Harley-street, W. c.
1877. *Chisholm, Edwin, M.D., Sydney, New South Wales.
1871. Churton, Thomas, M.D., 35, Park-square, Leeds. c.
1875. Clark, Andrew, F.R.C.S., 71, Harley-street, W.
1873. Clarke, Thomas Kilner, F.R.C.S., 66, John William-street, Huddersfield.
1883. Clarke, William Bruce, F.R.C.S., 46, Harley-street, W. c.
1894. Clinch, Thomas Aldous, M.B., 42, Grove-road, Regent's Park, N.W.
1879. *Clutton, Henry Hugh, F.R.C.S., 2, Portland-place, W. c 2. *Vice-President.*
1894. Cochrane, James Mackeand, M.D., 16, Weymouth-street, W.
1849. *Cockle, John, M.D., The Lodge, West Molesey, Surrey. p, vp, o, l 3, c 3, sm.
1893. Cole, Robert Henry, M.B., Moorcroft, Hillingdon, Middlesex.
1887. Collier, William, M.D., 62, High-street, Oxford. c.
1893. Collum, Archie Tillyer, F.R.C.S., Charing Cross Hospital, W.C.
1892. Colman, Walter S., M.D., 22, Wimpole-street, W.
1871. Cook, John, M.D., 1, Nottingham-terrace, Regent's Park, N.W.
1862. Cooper, Alfred, F.R.C.S., 9, Henrietta-street, Cavendish-square, W. c 3, vp.
1888. Cooper, Arthur, 20, Old Burlington-street, W.
1872. Corfield, William Henry, M.D., 19, Savile-row. c.
1892. Cotterell, Edward, F.R.C.S., 5, West Halkin-street, Belgrave-square, S.W.
1891. Coumbe, John Batten, M.D., Wargrave, Henley-on-Thames.
1879. Coupland, Sidney, M.D., 16, Queen Anne-street, W. c 2. *Vice-President.*
1889. Courtney, Guy Budd, M.B., 47, Seymour-street, W.
1874. Craigie, John Hamilton, 13, Savile-row, W. c.
1873. Craven, Robert Martin, F.R.C.S., J.P., 14, Albion-street, Hull.
1889. Crawford, James, M.D., Grosvenor-mansions, 80, Victoria-street, S.W.
1881. Cripps, William Harrison, F.R.C.S., 2, Stratford-place, W. c 2.
1880. Critchett, George Anderson, F.R.C.S. Edin., 21, Harley-street, W.
1880. Crocker, Henry Radcliffe, M.D., 121, Harley-street. c 3.
1881. Cross, Francis Richardson, F.R.C.S., Worcester House, Clifton, Bristol.
1890. Cullingworth, Charles James, M.D., 46, Brook-street, W. c 3.
1874. Cumberbatch, Alphonso Elkin, F.R.C.S., 80, Portland-place, W. c 2.

1892. Da Costa, Francis Xavier, F.R.C.S., Charing Cross Hospital, W.C.
1894. Dalby, John Lyttleton, M.R.C.S., Eastern Counties Hospital, Ipswich.
1871. Dalby, Sir William Bartlett, F.R.C.S., 18, Savile-row, W. c. *President.*

1864. Dale, George Cornelius, M.D., 13, Nightingale Park-crescent, Wandsworth Common, S.W.
1881. Dallaway, Dennis Joseph William, L.R.C.P. Edin., 5, Duchess-street, Portland-place, W.
1873. Daly, Owen, M.D., J.P., 23, Albion-street, Hull.
1885. Davies-Colley, John Neville Colley, F.R.C.S., 36, Harley-street, W. c 3.
1890. Davis, Henry, M.R.C.S., 60, Queen Anne-street, W.
1889. *Davison, James, M.D., Walderslow, Bournemouth.
1880. Davson, Smith Houston, M.D., Campden Villa, 203, Maida-vale, W. c 3.
1868. *Davy, Richard, F.R.C.S., F.R.S.E., Burstone House, Bow, North Devon. vp, s 2, sm, § 2.
1876. Dawes, Richard St. Mark, M.R.C.S., Gawler, South Australia.
1880. Dawson, Yelverton, M.D., Heathland, Southborne-on-Sea, Christchurch, Hants.
1867. Day, William Henry, M.D., 10, Manchester-square, W. c 3.
1894. Dean, Henry Percy, M.S., 84, Wimpole-street, W.
1883. Dent, Clinton Thomas, F.R.C.S., 61, Brook-street, Grosvenor-square, W. c 3.
1891. Diver, Ebenezer, M.D., Yately House, Kenley, Surrey.
1893. Dockrell, Morgan, M.D., 35, Bruton-street, W.
1885. Dodd, Henry Work, F.R.C.S., 136, Harley-street, W.
1882. Dolan, Thomas Michael, M.D., Horton House, Halifax. fm 1882.
1881. Doran, Alban Henry Griffiths, F.R.C.S., 9, Granville-place, W. c 3.
1890. Douglas, William, M.D., Dalkeith House, 7, Clarendon-place, Leamington Spa.
1871. Dowse, Thomas Stretch, M.D., 14, Welbeck-street, W. § 3, c 3.
1877. Drew, John Henry, M.R.C.S., 38, Eastbourne-terrace, Hyde Park, W. c 6.
1881. Drewitt, Frederic George Dawtrey, M.D., 2, Manchester-square, W.
1874. Drysdale, Charles Robert, M.D., 23, Sackville-street, W.
1886. Duckworth, Sir Dyce, M.D., 11, Grafton-street, Piccadilly, W.
1848. *Duncan, James, M.B., 8, Henrietta-street, Covent Garden, W.C.
1884. Duncan, William, M.D., 6, Harley-street, W.
1873. *Durham, Arthur Edward, F.R.C.S., 82, Brook-street, W. p, o, c. *Treasurer.*
1884. Durham, Frederick, F.R.C.S., 82, Brook-street, W.

1891. Eastes, Thomas, M.D., 3, Shakespeare-terrace, Folkestone.
1893. Eccles, Arthur Symons, M.B., 23, Hertford-street, Mayfair, W.
1892. Eddowes, Alfred, M.D., 25, Old Burlington-street, W.
1860. Edmunds, James, M.D., 29, Dover-street, W.
1880. Edwards, Frederick Swinford, F.R.C.S., 55, Harley-street, W. c. *Councillor.*
1868. Elliott, George Frederick, M.D., 1, Albion-street, Hull.

1882. Elliott, Thomas, M.D., Monson-place, Tunbridge Wells.
1889. Embleton, Dennis Cawood, M.R.C.S., St. Wilfrid's, Bournemouth.
1883. Emond, E., M.D., 113, Boulevard Beaumarchais, Paris.
1883. English, Edgar, M.R.C.S., High-street, Mexborough, near Rotherham.
1880. English, Thomas Johnston, M.D., 128, Fulham-road, S.W.
1889. Esler, Robert, M.D., 4, Queen's-road, Peckham, S.E.
1891. Euan-Smith, Euan McLaurin, M.R.C.S., 253, Cromwell-road, S.W.
1894. Evans, Willmott Henderson, F.R.C.S., 6, Gower-street, W.C.
1883. Ewart, Joseph, M.D., J.P., Retired Dep. Surgeon-General, Bengal Army, Montpellier Hall, Brighton. c.
1877. Ewart, William, M.D., 33, Curzon-street, Mayfair, W. c.

1889. Fairbank, Frederick Royston, M.D., 59, Warrior-square, St. Leonards-on-Sea.
1884. Fardon, Edward Ashby, M.R.C.S., Middlesex Hospital, W.
1873. Fayrer, Sir Joseph, K.C.S.I., LL.D., M.D., F.R.S., 53, Wimpole-street, W. p, vp, ll, sm, o, c.
1884. Fenton, Frederick Enos, F.R.C.S., Langstone, Ealing, W.
1888. Fenwick, Bedford, M.D., 20, Upper Wimpole-street, W.
1885. Fenwick, Edwin Hurry, F.R.C.S., 5, Old Burlington-street, W. *Councillor.*
1887. Ferrier, David, M.D. Edin., F.R.S., 34, Cavendish-square, W.
1878. Field, George, F.R.C.S., 34, Wimpole-street, W. c.
1883. Finlay, David White, M.D., 2, Queen's-terrace, Aberdeen. c 2.
1894. Fisher, Frederick Charles, F.R.C.S., King's Langley, Herts.
1876. Fisher, Frederic Richard, F.R.C.S., 17, Wimpole-street, W.
1884. Flint, Arthur, M.D., J.P., Westgate Lodge, Westgate-on-Sea.
1878. *Fonmartin, Henry de, M.D., 26, Newberry-terrace, Lower Bullar-street, Southampton.
1893. Forbes, Norman Hay, M.R.C.S., Montpelier Lodge, Tunbridge Wells.
1884. Fotherby, Henry Arthur, 17, Scarsdale-terrace, Cheniston-gardens, Kensington, W.
1879. Fowler, James Kingston, M.D., 35, Clarges-street, Mayfair, W. s 2, c.
1873. Fox, Arthur Edward Wellington, M.B., C.M., 16, Gay-street, Bath. c.
1887. Fox, Fortescue, M.D., Strathpeffer Spa, Ross-shire.
1871. Fox, Francis, M.R.C.S., 68, Wimpole-street, W. c 3.
1885. Fox, R. Hingston, M.D., 23, Finsbury-square, E.C.
1879. Fox, Thomas Colcott, M.B., 14, Harley-street, W. s 2. c 2.
1887. Frazer, Robert Fair, 185, Lavender-hill, New Wandsworth, S.W.
1868. Freer, Alfred, J.P., Stourbridge, Worcestershire.
1886. Frith, Baptist Gamble, M.B., 29, Cornwallis-gardens, Hastings.
1884. Frost, William Adams, F.R.C.S., 17, Queen Anne-street, W. c 2.

1883. Gabbett, Henry Singer, M.D., 8, Chiswick-place, Eastbourne.
1862. Gant, Frederick James, F.R.C.S., 16, Connaught-square, W. p, vp 2, ll, o, c 3.
1847. *Garrod, Sir Alfred Baring, M.D., F.R.S., 10, Harley-street, W. p, vp 2, ll, o, c 9.
1887. Garrod, Archibald Edward, M.D., 9, Chandos-street, Cavendish-square, W. c. *Councillor.*
1891. Gaster, Aughel, M.D., 224, Belsize-road, N.W.
1887. Gay, John, 119, Upper Richmond-road, Putney, S.W.
1879. Gibbes, Heneage, M.D., The University, Michigan, U.S.A.
1856. Gibbon, Septimus, M.B., 39, Oxford-terrace, W.
1882. Gibbons, Robert Alexander, M.D., 29, Cadogan-place, S.W.
1893. Gibson, Charles, M.D., Fern Villa, Harrogate.
1881. Giffard, Douglas W., M.R.C.S., 5, Pavilion-parade, Brighton.
1867. Gill, William, M.R.C.S., 11, Russell-square, W.C. c.
1894. Gill, Richard, F.R.C.S., 72, Wimpole-street, W.
1869. Godson, Clement, M.D., 9, Grosvenor-street, W. vp, c 3, s 2, sm.
1873. Goodsall, David Henry, F.R.C.S., 17, Devonshire-place, Portland-place, W. vp 2. c, s 2, sm, cfc 7. *Chairman, House and Finance Committee.*
1892. Gordon, Robert John, M.B., Kwangchengtaii Newchwang, North China.
1878. *Gould, Alfred Pearce, M.S., 10, Queen Anne-street, W. s 2, c 3. *Orator.*
1876. Gowers, William Richard, M.D., F.R.S., 50, Queen Anne-street, W. vp, c, sm, ll. fm. 1893.
1874. Gowland, Peter Yeames, F.R.C.S., 82, Gloucester-terrace, Hyde-park, W.
1887. Grant, James Edward Roney, 2, Charing Cross-chambers, Duke-street, Adelphi, W.C.
1881. Green, Thomas Henry, M.D., 74, Wimpole-street, W. c 2. vp.
1868. Gregson, George, M.R.C.S., 63, Harley-street.
1886. Greves, Edwin Hyla, M.D., Rodney House, Bournemouth.
1873. Grieve, Robert, M.D., British Guiana.
1884. Griffith, David Charles Ballinger, M.R.C.P. Edin. (address uncommunicated).
1875. Griffith, G. de Gorrequer, M.R.C.S., 34, St. George's-square, S.W.
1885. Griffiths, Charles Thomas, L.R.C.P., 206, Lozells-road, Birmingham.
1884. Griffiths, Herbert Tyrrell, M.B., 5, Kensington-square, W.
1880. Gristock, William, M.D. Lond., 6, Finchley-road, N.W.
1893. Gubb, Alfred Samuel, M.D., 29, Gower-street, W.C.
1891. Guthrie, Leonard G., M.D., 15, Upper Berkeley-street, W.

1886. Habershon, S. Herbert, M.D., 70, Brook-street, Grosvenor-square, W.
1891. Hadley, Wilfred J., M.B., 11, Wimpole-street, W.

1887. Haig, Alexander, M.B., 7, Brook-street, W
1884. Hairsine, Hudson, Roose House, Upper Tooting, S.W.
1881. Hall, Charles Ross, M.R.C.S., Hatfield, Herts.
1874. *Hall, Francis de Havilland, M.D., 47, Wimpole-street, W. vp 2 c 4, s 2, sm. *Councillor.*
1885. Halpin, Richard Frederich Bestall, Arklow, co. Wicklow, Ireland.
1881. Hames, George Henry, F.R.C.S., 29, Hertford-street, Mayfair, W.
1892. Hamilton, John Butler, M.D., Surgeon-Colonel, 28, Cockspur-street, Charing Cross, S.W.
1879. Hamilton, Seton Guthrie, Surgeon-Captain, 1st Life Guards.
1891. Handfield-Jones, Montagu, M.D., 35, Cavendish-square, W.
1850. *Hare, Charles John, M.D., *Honorary Fellow* (*q.v.*).
1888. Hare, Hobart Amory, 222, South Fifteenth-street, Philadelphia. fm. 1888.
1891. Harold, John Patrick, M.R.C.S., 91, Harley-street, W.
1882. Harper, Gerald Samuel, M.B., 40, Curzon-street, Mayfair, W. c.
1871. Harris, Charles James, M.R.C.S., 4, Kilburn Priory, N.W.
1871. Harrison, Reginald, F.R.C.S., 6, Lower Berkeley-street, Portman-square. vp 2, ll, c 1.
1883. *Hartridge, Gustavus, F.R.C.S., 65, Green-street, Grosvenor-square, W.
1882. Harvey, John Stephenson Selwyn, M.D., 1, Astwood-road, Crom-well-road, S.W.
1882. Haslam, William Frederick, F.R.C.S., 24, York-road, Edgbaston, Birmingham. c 3.
1852. *Haward, Edwin, M.D., 34a, Gloucester-place, W.
1883. Hawken, Charles St. Aubyn, 20, North-terrace, Wandsworth, S.W.
1889. Hawkins, Francis Henry, M.B., Portland-place, Reading.
1890. Hebb, Frederick Theodore, M.R.C.S., 7, Milner-terrace, Cadogan-square, S.W.
1891. Hensman, Frank, M.R.C.S., Surgeon-Major, 1st Life Guards.
1883. Herman, George Ernest, M.B., 20, Harley-street, W.
1879. Heron, George Allan, M.D., 57, Harley-street, Cavendish-square, W. c 3.
1886. Herringham, Wilmot Parker, M.B., 13, Upper Wimpole-street, W.
1883. Herschell, George A., M.D., 25, Queen Anne-street, W.
1883. Hewitt, Frederick William, M.D., 10, George-street, Hanover-square, W. *Councillor.*
1876. Heycock, Francis Raworth, C.M., 26, Upper Wimpole-street, W.
1872. Hicks, John Braxton, M.D., F.R.S., 34, George-street, Hanover-square. c.
1892. Hill, William, M.D., 24, Wimpole-street, W.
1873. Hobson, William Henry, M.R.C.S., Great Berkhamstead, Herts.
1879. Hogg, Arthur John, M.R.C.S., Leslie Lodge, Haven-green, Ealing, W.
1892. Hogg, Frederick Stapleton D., M.R.C.S. (address uncommunicated).
1884. Holland, Charles Edward, M.B., 44, Warwick-road, Maida-vale, W.
1888. Holm, John, F.R.C.S. Edin., 13, Stratford-place, W.

1868. Holman, Constantine, M.D., 26, Gloucester-place, Portman-square, W. c 4.
1881. Hood, Donald William Charles, M.D., 43, Green-street, W. c 2.
1893. Horrocks, Herbert, M.D., 41, Parkfield-road, Sefton Park, Liverpool.
1883. *Hovell, T. Mark, F.R.C.S. Edin., 105, Harley-street, W.
1886. Huddart, Cuthbert Henry Cooke, M.B., Shoyswell Manor, Etchingham, Sussex.
1885. Hudson, Charles Elliott Leopold Barton, F.R.C.S., 8, Queen Anne-street, W.
1890. Hughes, Edgar, F.R.C.S., 91, Onslow-gardens, South Kensington, S.W.
1864. Hume, Frederick Henry, M.D., 53, Devonshire-street, Islington, N.
1884. Hunter, Sir Guyer, M.D., 21, Norfolk-crescent, Hyde Park, W.
1889. Hunter, William, M.D., 54, Harley-street, W.
1881. Hutchinson, Jonathan, F.R.C.S., F.R.S., 15, Cavendish-square. p, ll, c 5, o.
1892. Hutchinson, Jonathan, Jun., F.R.C.S., 1, Park-crescent, Portland-place, W.
1875. Hutchinson, Samuel John, M.R.C.S., 64, Brook-street, W.

1889. I'Anson, William Andrew, Denton Hall, Newcastle-on-Tyne.
1891. Isaac, George Washington, M.B., 75, Gower-street, W.C.

1884. *Jackson, Frederick William, M.D., Yorkgate House, Broadstairs.
1885. Jackson, James, M.R.C.S., 15, Huntingdon-street, Barnsbury, N.
1868. Jackson, John Hughlings, M.D., F.R.S., 3, Manchester-square, W. p, vp, o, c 5.
1874. Jagielski, Victor Apollinaris, M.D., 54, York-terrace, Regent's Park, N.W.
1882. James, Joseph Brindley, M.R.C.S., 47, Clovelly Mansions, Gray's-inn-road, W.C.
1887. Jamison, Arthur Andrew, M.D., 18, Lowndes-street, Belgrave-square, S.W.
1884. Jennings, Charles Egerton, M.D., 48, Seymour-street, W.
1886. Jervis, Arthur, M.R.C.S., Seamen's Hospital, Greenwich, S.E.
1883. Jessop, Walter Hamilton, F.R.C.S., 73, Harley-street, W.
1893. Johnston, George Francis, M.D., 6, Manchester-square, W.
1886. Johnston, James, M.D., 83, King William-street, E.C.
1893. Joll, Boyd Burnett, M.B., 6, Mandeville-place, W.
1888. Jones, Arthur Henry, M.D., 45, Sheep-street, Northampton.
1893. Jones, Henry Lewis, M.D., 9, Upper Wimpole-street, W.
1890. Jones, H. Macnaughton, M.D., 141, Harley-street, Cavendish-square, W.
1888. Jones, John Talfourd, M.B., Rosebank, South-terrace, Eastbourne, Sussex.

1892. *Jones, Robert, F.R.C.S., 11, Nelson-street, Liverpool.
1881. Jones, Thomas William Carmalt, F.R.C.S. Edin., 6, Westbourne-street, Hyde Park, W.
1893. Joule, John Samuel, M.D., 32, Maida-hill West, W.
1877. Juler, Henry Edward, F.R.C.S., 23, Cavendish-square, W.

1889. Kauffmann, Otto Jackson, M.D., 22, Broad-street, Birmingham.
1874. Kavanagh, Patrick, M.D., 81, Marine-parade, Brighton.
1891. Keegan, Denis Francis, M.D., Surgeon-Major, East India United Service Club, St. James's-square, S.W.
1884. Keetley, Charles Bell, F.R.C.S., 56, Grosvenor-street, W. c 3.
1892. Keiffenheim-Trubridge, Luigi W. A., M.D., 4, Cliveden-place, Eaton-square, S.W.
1847. *Kellock, William Berry, M.D., 94, Stamford-hill, N.
1890. Kelly, Augustin Bernard, M.R.C.S., 82, Park-street, Grosvenor-square, W.
1891. Kelson, William Henry, M.D., 46, Watling-street, E.C.
1883. Kemp, John Robert, M.R.C.S., 101, Jermyn-street, S.W.
1890. Ker, Hugh Richard, F.R.C.S. Edin., Tintern, 2, Balham Hill, S.W.
1884. Kerr, Norman, M.D., 42, Grove-road, N.W.
1881. Keser, Jean Samuel, M.D., 11, Harley-street, W. c 2, § 3.
1876. Key, Augustus Cooper, M.D., 30, Wilton-place, S.W. c 2.
1886. Kidd, Percy, M.D., 60, Brook-street, W. c 2.
1889. Kirkham, Frederick William, Downham Market, Norfolk.
1883. Knapton, George, 11, Albert-terrace, Queen's-square, Blackpool.
1875. Knox, John, M.D., Bethnal Green Infirmary, E.

1889. Lake, Richard, F.R.C.S., 35, Harley-street, W.
1868. Lake, William Charles, M.D., Teignmouth, Devon.
1872. Langdon-Down, John L. H., M.D., J.P., 81, Harley-street, W. v.p, L.L.
1881. Langton, John, F.R.C.S., 62, Harley-street, W. c 2.
1882. Larkin, F. Colet, M.B., Kingsbridge House, Avenue-road, East Cliff, Ramsgate.
1890. Law, Edward, M.D. Edin., 35, Harley-street, W.
1890. Lawrie, Edward, M.B. Edin., Surgeon-Major, Bengal Army, The Residency, Hyderabad.
1858. Lawson, George, F.R.C.S., 12, Harley-street, W. vp 2, c 3.
1891. Lazarus-Barlow, Walter Sydney, M.B., The Acacias, Chesterton, Cambridge.
1893. Lee, E. Samuel, M.D., 31, Pevensey-road, St. Leonards-on-Sea.
1887. Leggatt, Charles Ashley Scott, M.D., 2, Walton-place, S.W.
1886. Lewers, Arthur Hamilton Nicholson, M.D. Lond., 60, Wimpole-street, W.
1867. Lichtenberg, George, M.D., 47, Finsbury-square. c 2.
1893. Light, Edwin Mellor, M.B., 2, Wilton-place, S.W.

1878. Lister, Sir Joseph, Bart., D.C.L., LL.D., F.R.C.S., F.R.S., 12, Park-crescent, Portland-place. o.
1890. Lithgow, Robert Alexander Douglas, M.D., LL.D., 27A, Lowndes-street, S.W.
1889. Little, Ernest Muirhead, F.R.C.S., 40, Seymour-street, Portman-square, W.
1889. Little, Fletcher, M.D., 32, Harley-street, W.
1887. Lloyd, Robert Hodgens, M.D., Brook House, Kennington-road, S.E.
1886. Lloyd, Samuel, M.D., 4, High-street, Bloomsbury, W.C.
1878. Lockwood, Charles Barrett, F.R.C.S., 19, Upper Berkeley-street, W. c. *Honorary Secretary.*
1873. Loe, James Scarborough, 26, Woodhouse-lane, Leeds.
1881. Lorimer, G., M.D., 9, Terrace-road, Buxton, Derbyshire.
1868. Lowe, John, M.D., J.P., 4, Gloucester-place, Portman-square, W. c 3.
1868. *Lund, Edward, F.R.C.S., 22, St. John's-street, Manchester. o, c 3.
1889. Lunn, Henry Simpson, M.D., 5, Endsleigh-gardens, N.W.
1889. Lush, Percy, M.B., 4, Maresfield-gardens, Hampstead, N.W.

1884. MacBryan, Henry Crawford, Kingsdown House, Box, Wilts.
1871. MacCormac, Sir William, F.R.C.S., 13, Harley-street, W. p, vp, § 2, c 4, o.
1882. MacKellar, Alexander Oberlin, F.R.C.S., 79, Wimpole-street, W.
1894. Mackenzie, Hector William Gavin, M.D., 59, Welbeck-street, W.
1880. Mackenzie, Stephen, M.D., 18, Cavendish-square, W. vp 2, c 4, ll.
1881. Maclagan, Thomas John, M.D., 9, Cadogan-place, S.W. c 3.
1861. MacLaren, Alexander Connell, 60, Harley-street, W.
1891. Maclean, Allan, Harpenden Hall, Herts.
1887. Macready Jonathan Foster Christian Horace, F.R.C.S., 51, Queen Anne-street, W.
1883. Maddick, Edmund Distin, F.R.C.S. Edin., 2, Chandos-street, Cavendish-square, W.
1885. Maguire, Robert, M.D., 4, Seymour-street, W. c 2.
1878. Mair, Robert Slater, M.D., 28, Ledbury-road, Bayswater, W.
1890. Malcolm, John David, F.R.C.S. Edin., 13, Portman-street, Portman-square, W.
1893. Malcolm, William A., M.B., Oak House, 421, Holloway-road, N.
1887. Mantle, Alfred, M.D., Savile-place, Halifax.
1888. Mapother, Edward Dillon, M.D., 32, Cavendish-square, W. c. *Councillor.*
1891. Marsh, Howard, F.R.C.S., 30, Bruton-street, W.
1892. Marshall, Arthur Lumsden, M.B., 56, Rectory-road, N.
1873. Marshall, Edward, M.R.C.S., Mitcham, Surrey.
1869. Marshall, William, M.D., Torrieburn, Barnes, S.W. *Councillor.*

1864. Marshall, William Gurslave, F.R.C.S., 72, Bromfelde-road, Clapham, S.W.
1889. Martin, John Michael Harding, M.D., Arnheim, Blackburn, Lancashire.
1890. Martin, Sidney, M.D., 10, Mansfield-street, W.
1893. Mason, George Armstrong, M.B., 45, George-street, Portman-square, W.
1884. Matheson, Farquhar, M.B., 11, Soho-square, W.
1891. Maude, Arthur, M.R.C.S., Winterton House, Westerham, Kent.
1892. Maunsell, H. Widenham, M.D., 102, Cromwell-road, S.W.
1892. May, Chichester Gould, M.D., 26, Walton-street, Pont-street, S.W.
1891. May, William Page, M.D., 38, Weymouth-street, W.
1885. McConnel, Henry Wilson, M.B., Litchdon, Barnstaple, Devon.
1885. McGeagh, Thomas Edwin Foster, M.D., 23, New Cavendish-street, W.
1873. McHardy, Malcolm Macdonald, F.R.C.S. Edin., 5, Savile-row, W.
1884. Meredith, William Appleton, C.M., 21, Manchester-square, W. *Councillor.*
1864. Middlemist, Robert Percy, M.R.C.S., 6, Devonport-street, Hyde Park, W. c 4.
1883. Moore, Thomas, F.R.C.S., 6, Lee-terrace, Blackheath, S.E.
1883. Morgan, John Hammond, F.R.C.S., 68, Grosvenor-street, W. s 2, c
1893. Morison, Alexander, M.D., 14, Upper Berkeley-street, W.
1871. Morley, Alexander, 42, Albemarle-street, W.
1881. Morris, Henry, F.R.C.S., 8, Cavendish-square, W. c.
1878. Morris, Malcolm Alexander, F.R.C.S. Edin., 8, Harley-street W. c 2.
1882. Morton, Andrew Stanford, F.R.C.S., 26, Weymouth-street, Portland-place, W.
1884. *Moullin, Charles William Mansell, F.R.C.S., 69, Wimpole-street, W.
1893. Murphy, George Wyndham, M.B., J.P., 98, Gloucester-crescent, Hyde Park, W.
1886. Murphy, James, M.D., Holly House, Sunderland.
1884. Murray, Fred., M.B., Durbanville, Cape Colony, South Africa.
1890. Murray, George, M.R.C.S., 34, Wimpole-street, Cavendish-square, W.
1886. Murray, Hubert Montague, M.D., 27, Savile-row, W. c. *Councillor.*
1879. Murrell, William, M.D., 17, Welbeck-street, W.

1893. Napier, Alexander Disney Leith, M.D., 67, Grosvenor-street, W.
1877. Nesbitt, Dawson, M.D., 1, Norfolk-square, Hyde Park, W.
1876. Newham, James, 80, Gloucester-place, W.
1889. *Nias, J. Baldwin, M.D., 40, Brook-street, Grosvenor-square, W.
1880. Nix, Edward James, M.D., 11, Weymouth-street, W. *Councillor.*

1887. Oakley, Adam Robert Hamilton, L.R.C.P., Treath, Hornchurch, Essex.
1885. Ogilvie, Leslie, M.B., 46, Welbeck-street, W.
1884. Ogle, Charles John, 1, Cavendish-place, W.
1884. Oliver, George, M.D., West End Park, Harrogate.
1892. Openshaw, Thomas Horrocks, F.R.C.S., 16, Wimpole-street, W.
1875. Ord, William Miller, M.D., 37, Upper Brook-street, W. P, O, C 4.
1892. Ord, William Wallis, M.D., 2, Queen-street, Mayfair, W.
1887. Ormerod, Joseph Arderne, M.D., 25, Upper Wimpole-street, W. C.
1889. Orton, George Hunt, M.B., 1A, Campden Hill-road, Kensington, W.
1884. Orwin, Arthur Wigelsworth, M.D., 15, Weymouth-street, Portland-place, W.
1894. Osborn, Samuel, F.R.C.S., J.P., Maisonnette, Datchet, near Windsor.
1880. Oswald, James Waddell Jeffreys, M.D., 245, Kennington-road, S.E.
1883. Owen, Charles J. Rayley, 14, Devonshire-terrace, Hyde Park, W.
1878. *Owen, Edmund, F.R.C.S., 64, Great Cumberland-place, W. VP 2, C 3, S 2, SM, LL. *Trustee.*
1881. Owen, Isambard, M.D., 40, Curzon-street, Mayfair, W. S 2, C 4.

1886. Paget, Stephen, F.R.C.S., 57, Wimpole-street, W. C 2.
1880. Palmer, Frederick Stephen, M.D., Compton Lodge, East Sheen, S.W.
1882. Palmer, William Pitt, M.B., 17, Belgrave-terrace, Torquay.
1877. *Paramore, Richard, M.D., 2, Gordon-square, W.C.
1867. Parkinson, George, 50, Brook-street, Grosvenor-square, W.
1881. Parrott, Edward John, M.R.C.S., The Thorn, Hayes, Middlesex.
1871. Parsons, Francis Henry, M.D., "The Hurst," West Worthing.
1885. Pasteur, William, M.D., 4, Chandos-street, Cavendish-square, W. S 2. *Councillor.*
1872. Patten, Charles Arthur, M.R.C.S., Marpool House, Ealing, W.
1891. Patterson, Charles Sumner, M.B., 40, Highbury-place, N.
1890. Pattison, Edward Seton, M.R.C.S., Granville House, Fulham-park, S.W.
1861. Paul, John Hayball, M.D., Camberwell House, Camberwell, S.E. C 6.
1854. *Pavy, Frederick William, M.D., F.R.S., 35, Grosvenor-street, W. VP, LL, C.
1881. *Peacey, William, M.D., 11, Breakspears-road, Brockley, S.E.
1883. Peck, Edward George, M.A., Queensbury, Bradford, Yorks.
1871. Pedler, George Henry, M.R.C.S., 6, Trevor-terrace, Knightsbridge, S.W.
1883. Perigal, Arthur, M.D., New Barnet, Herts.
1894. Phillipps, William Alfred, M.D., 13, John-street, Berkeley-square, W.
1876. Phillips, Charles Douglas Ferguson, M.D., F.R.S.E., 10, Henrietta-street, Cavendish-square, W. C 3.

1873. Phillips, George Richard Turner, M.R.C.S., 24, Palace-court, Bayswater-hill, W. c 2.
1885. Phillips, John, M.D., 71, Grosvenor-street, W.
1883. Phillips, Sidney Philip, M.D. Lond., 62, Upper Berkeley-street, Portman-square, W.
1878. Phillips, Sutherland Rees, M.D., St. Ann's Heath, Virginia Water, Berks.
1883. Pick, Thomas Pickering, F.R.C.S., 18, Portman-street, W. c 2.
1884. Piesse, C. H., M.R.C.S., 2, New Bond-street, W.
1883. Pitts, Bernard, F.R.C.S., 109, Harley-street, Cavendish-square. c 5, s 2.
1890. Pope, Harry Campbell, M.D. Lond., 280, Goldhawk-road, Shepherd's Bush, W.
1873. Port, Heinrich, M.D., 48, Finsbury-square, E.C. *Hon. Sec. Foreign Correspondence.*
1850. *Potts, William, F.R.C.S., 2, Albert-terrace, Regent's Park, N.W. c 3.
1871. Powell, Richard Douglas, M.D., 62, Wimpole-street, W. p, vp, c 5, o.
1891. Powell, William Wyndham, F.R.C.S., 34, Cliveden-place, Eaton-square, S.W.
1891. Preston, Theodore Julian, M.R.C.S., Staff Surgeon, Royal Navy, 7, Caroline-place, Mecklenburgh-square, W.C.
1891. *Prickett, Marmaduke, M.D., 27, Oxford-square, W.
1885. Pringle, John James, M.B., 23, Lower Seymour-street, W.
1889. Pritchard, Owen, M.D., 37, Southwick-street, Hyde Park, W.
1873. Purcell, Ferdinand Albert, M.D., 7, Manchester-square, W.

1870. Quain, Sir Richard, Bart., M.D., F.R.S., 67, Harley-street, W. vp, c 3.

1883. Ralfe, Charles Henry, M.D., 26, Queen Anne-street, W. *Councillor.*
1892. Ramsay, James, M.D., High Peter-gate, York.
1861. Ramskill, Jabez Spence, M.D., 5, St. Helen's-place, E.C.
1894. Rankin, Guthrie, M.D., 23, Jury-street, Warwick.
1881. Ranking, John Ebenezer, M.D., Hanover House, Tunbridge Wells.
1859. *Rayner, John, M.R.C.P. Edin., Swaledale House, Highbury-quadrant, N.
1890. Rayner, William, M.R.C.S., 4, Dorset-square, N.W.
1850. *Read, Reginald, F.R.C.P. Edin., 4, Oakfield-terrace, Uxbridge-road, W.
1879. Reeves, Henry Albert, F.R.C.S. Edin., 7, Grosvenor-street, W.
1890. Reid, John, M.B., Clanmurray, Dromore, co. Down.
1882. Reid, Thomas Whitehead, F.R.C.P. Edin., 34, St. George's-place, Canterbury.
1887. Remfry, Leonard, M.D., 60, Great Cumberland-place, Hyde Park, W.

1872. Reynolds, John Russell, M.D., F.R.S., 38, Grosvenor-street, W. c 3.
1872. Richards, Joseph Peeke, M.R.C.S., 6, Freeland-road, Ealing, W. c 3.
1850. *Richardson, Sir Benjamin Ward, M.D., LL.D., F.R.S., 25, Manchester-square, W. p, vp, ll, c 5, o, fm 1854.
1868. *Roberts, David Lloyd, M.D., F.R.S.E., 11, St. John's-street, Manchester.
1857. Roberts, David Watkin, M.D., 56, Manchester-street, W.
1885. Roberts, Edward Coleridge, M.R.C.S., Southgate, N.
1874. Roberts, Frederick Thomas, M.D., 102, Harley-street, W. *Vice-President, Lettsomian Lecturer.*
1889. Roberts, Sir William, M.D., F.R.S., 8, Manchester-square, W. c.
1873. Robertson, William Henry, M.D., J.P., 6, The Square, Buxton, Derbyshire.
1884. Robinson, Arthur Henry, M.D., The Infirmary, Bancroft-road, N.E.
1847. *Rogers, William Richard, M.D., 56, Berners-street, W. vp, c 6.
1890. Root, Arthur Guernsey, M.D., 46, Eagle-street, Albany, New York, U.S.A.
1886. Rose, Robert Duncan, F.R.C.S., St. Leonard's-place, York.
1874. Rose, William, F.R.C.S., 17, Harley-street. c 2, ll, vp 2.
1883. *Ross, Daniel McClure, F.R.C.S.
1888. *Roth, Bernard, F.R.C.S., J.P., 29, Queen Anne-street, W.
1893. Roughton, Walter, F.R.C.S., Cranborne House, New Barnet, Herts.
1876. Routh, Alfred Curtis, 33, Marina, St. Leonards-on-Sea.
1881. Routh, Amand, M.D., 14a, Manchester-square, W. c 2. *Honorary Secretary.*
1848. *Routh, Charles Henry Felix, M.D., 52, Montagu-square, W. p, vp 2, o, ll, s 4, c 6, sm. *Trustee.*
1891. Ruffer, Marc Armand, M.D., 5, York-terrace, Regent's Park, N.W.
1887. Rushworth, Frank, M.D., "Langdale," Goldhurst-terrace, South Hampstead, N.W.
1889. Russell, James Samuel Risien, M.B., 4, Queen Anne-street, W.
1886. Rutherfoord, Henry Trotter, M.D., Billett-street, Taunton.
1879. Ryley, James Beresford, M.D., 54a, Welbeck-street, W.

1887. Sainsbury, Harrington, M.D., 63, Welbeck-street, W.
1884. Salter, Thomas Knight, M.R.C.S.
1863. *Sansom, Arthur Ernest, M.D., 84, Harley-street, W. vp, s 2, c 5, sm, §, ll, o.
1886. Savage, George Henry, M.D., 3, Henrietta-street, W. c.
1886. Savill, Thomas Dixon, M.D., 12, Upper Berkeley-street, W.
1873. Sedgwick, James, M.D., Boroughbridge, Yorkshire.
1868. Sedgwick, Leonard William, M.D., 2, Gloucester-terrace, Hyde Park, W. vp 2, c 4, § 3.

1883. Semon, Felix, M.D., 39, Wimpole-street, W. §, c.
1887. Servais, Leopold, M.D., Antwerp, Belgium.
1889. Shaw, George, M.B., 1, The Drive, West Brighton.
1894. Shaw, Harry Charles Costello, M.R.C.S., 98, Priory-road, West Hampstead, N.W.
1884. Shaw, John, M.D., Burlington House, Willoughby-road, Hampstead, N.W.
1886. Sheild, Arthur Marmaduke, F.R.C.S., 4, Cavendish-place, W. c 2, s 2.
1890. Sheppard, William John, M.D., Laurel House, Putney, S.W.
1871. Shettle, Richard Charles, M.D., 73, London-street, Reading.
1881. Shipton, Arthur, F.R.C.S. Edin., Buxton, Derbyshire.
1878. Shipton, William Parker, M.R.C.S., J.P., Buxton, Derbyshire.
1885. Shoemaker, John V., M.D., 1031, Walnut-street, Philadelphia, U.S.A.
1894. Shuttleworth, George Edward, M.D., Ancaster House, Richmond, Surrey.
1890. Silk, John Frederick William, M.D., 29, Weymouth-street, W.
1890. Simon, Robert M., M.D., 27, Newhall-street, Birmingham.
1884. Simpson, James Herbert, M.D., The Crescent, Rugby, Warwickshire.
1884. Sinclair, John, M.R.C.P., General Post Office, St. Martin's-le-Grand, E.C.
1891. Sisley, Richard, M.D., 11, York-street, Portman-square, W.
1883. *Skerritt, Edward Markham, M.D., Richmond Hill, Clifton.
1886. Slater, Charles, M.B., 16, Northwick-terrace, St. John's Wood, N.W.
1862. Slight, George, M.D., 14, Old Burlington-street, W. c 2.
1889. Smale, Morton, M.R.C.S., 22a, Cavendish-square, W.
1845. *Smiles, William, M.D., St. Martha's Lodge, Guildford. vp 2, s 4, c 9, sm.
1893. Smith, Frederick Augustus Alfred, M.D., Portland House, Cheltenham.
1887. Smith, Frederick John, M.D., 4, Christopher-street, Finsbury-square, E.C.
1882. Smith, Herbert Urmson, Oudtshoorn, Cape of Good Hope, South Africa.
1873. Smith, Heywood, M.D., 18, Harley-street, W. c 3.
1880. Smith, Noble, F.R.C.S. Edin., 24, Queen Anne-street, W.
1891. Smith, Solomon Charles, M.D., 4, Portman-mansions, Baker-street, W.
1877. Smith, Sydney Lloyd, M.R.C.S., 25, Argyle-square, King's Cross, W.C.
1882. Smith, Thomas Frederick Hugh, F.R.C.S., Farningham, Kent.
1873. *Smith, Thomas Gilbart, M.D., 68, Harley-street, W. vp 2, s 2, sm, c 4. *Trustee.*
1872. Smith, Walter, M.R.C.P. Edin., Orleans House, 60, Regent's Park-road, N.W.

1874. Smyth, William Woods, Maidstone.
1894. Snow, Herbert, M.D., 6, Gloucester-place, W.
1893. Spencer, Herbert Ritchie, M.D., 10, Mansfield-street, W.
1888. Spencer, John, Lyons-terrace, Hetton, Durham.
1869. Spender, John Kent, M.D., 17, Circus, Bath. FM 1874.
1887. Spicer, Scanes, M.D., 28, Welbeck-street, W.
1883. Spitta, Edmund Johnson, M.R.C.S., Ivy House, Clapham Common, S.W.
1864. Squire, Alexander John Balmanno, M.B., 24, Weymouth-street, Portland-place.
1881. Startin, James, M.R.C.S., 15, Harley-street, W.
1892. Staveley, William H. C., F.R.C.S., 13, South Eaton-place, S.W.
1884. Stephens, William John, 9, Old Steyne, Brighton.
1892. Stewart, Hastings, M.R.C.S., 13A, Charles-street, St. James's, S.W.
1882. Stewart, James, F.R.C.P. Edin., Dunmurry, Sneyd-park, near Clifton.
1891. Stewart, William Edward, F.R.C.S. Edin., 16, Harley-street, W.
1883. Stewart, William Robert Henry, F.R.C.S. Edin., 42, Devonshire-street, Portland-place, W.
1884. Stiven, Edward Winnan Fleming, M.D., Lincoln House, Harrow, Middlesex.
1885. Stivens, B. H. Lyne, M.D., 11, Kensington Gardens-square, W.
1848. *Stocker, John Sherwood, M.D., 2, Montagu-square, W. C 10, S 2.
1884. Stoker, George, M.R.C.S., J.P., 14, Hertford-street, Mayfair, W.
1892. Stonham, Charles, F.R.C.S., 4, Harley-street, W.
1877. Stowers, James Herbert, M.D., 41, Finsbury-square, E.C.
1873. Strange, William Heath, M.D., 5, Grosvenor-street, W. C 3.
1881. Sturge, William Allen, M.D., Maison Malausséna, Boulevard Dubouchage 29, Nice. SM.
1889. Sumpter, Walter John Ernely, M.R.C.S., Sheringham, Norfolk.
1892. Sunderland, Septimus, M.D., 35, Bruton-street, W.
1876. *Sutherland, Henry, M.D., 6, Richmond-terrace, Whitehall, S.W.
1892. Sutton, J. Bland, F.R.C.S., 48, Queen Anne-street, W.
1892. Swift, William John Cropley, M.R.C.S., 4, Gordon-square, W.C.
1885. *Syers, Henry Walter, M.D. Camb., 3, Devonshire-street, Portland-place, W.
1884. Symonds, Horatio Percy, F.R.C.S., 35, Beaumont-street, Oxford.
1893. Symonds, Charles James, F.R.C.S., 26, Weymouth-street, W.

1864. Tait, Edward Wilmshurst, M.R.C.S., 48, Highbury-park, N.
1879. *Tait, Lawson, F.R.C.S., 7, The Crescent, Birmingham.
1875. Tamplin, Charles Harris, M.R.C.S., "Lindfield," Crescent-road, Ramsgate.
1882. Taylor, Seymour, M.D., 16, Seymour-street, Portman-square, W. C 2.
1859. Thompson, Edmund Symes, M.D., 33, Cavendish-square, W. VP, O, S 3, C 3, SM.
1855. Thompson, Sir Henry, F.R.C.S., 35, Wimpole-street, W. VP., LL., C 4.

1873. Thomson, John Roberts, M.D., Monkchester, Bournemouth, Hants.
1894. Thomson, St. Clair, M.D., 28, Queen Anne-street, W.
1884. Thomson, William Sinclair, M.D., 1, Palace-court, Notting Hill Gate, W.
1892. Thornton, George, M.D., Fountain Hospital, Lower Tooting, S.W.
1876. Thornton, John Knowsley, M.C., J.P., 49, Montagu-square, W. P, VP, C 3.
1867. Thorowgood, John Charles, M.D., 61, Welbeck-street, W. LL, S 2, SM, C 3.
1856. Thudichum, John Louis William, M.D., 11, Pembroke-gardens, Kensington, W. VP, LL, O, C.
1884. Thursfield, Thomas William, M.D., J.P., Selwood, Beauchamp-square, Leamington.
1867. Timms, Godwin William, M.D., 9D, Cornwall Mansions, Clarence Gate, Regent's Park, N.W.
1865. Travers, William, M.D., 2, Phillimore-gardens, Kensington, W. C.
1884. *Treves, Frederick, F.R.C.S., 6, Wimpole-street, W. C 2, LL. *Vice-President.*
1882. Tuke, Charles Molesworth, Chiswick House, Chiswick.
1886. Tuke, Thomas Seymour, M.B. Oxon., Chiswick House, Chiswick.
1884. Turner, George R., F.R.C.S., 49, Green-street, Grosvenor-square, W. C 2.
1890. Tweed, Edward Reginald, M.D., 55, Upper Brook-street, W.
1883. Tweedy, John, F.R.C.S., 100, Harley-street, W.
1891. Tyson, William Joseph, M.D., 10, Langhorne-gardens, Folkestone.

1887. *Underwood, Edward T., M.D., Fort Bombay, India.

1883. Venning, Edgcombe, F.R.C.S., 30, Cadogan-place, S.W.
1874. Verley, Reginald Louis, F.R.C.P. Edin., 28B, Devonshire-street, Portland-place, W.
1893. Voelcker, Arthur Francis, M.D., 31, Harley-street, W.

1892. Waggett, Ernest Blechynden, M.B., 66, Park-street, Grosvenor-square, W.
1850. *Waggett, John, M.D., Perivale, Bournemouth; and Union Club, S.W.
1889. Wakefield, Thomas, M.B., 37, Nottingham-place, W.
1884. Wakley, Thomas, 5, Queen's-gate, S.W.
1850. *Wakley, Thomas Henry, F.R.C.S., 5, Queen's-gate, S.W.
1894. Wallis, Frederick Charles, F.R.C.S., 26, Welbeck-street, W.
1880. Walsham, William Johnson, F.R.C.S., 77, Harley-street, W. C.
1894. Waring, Holburt Jacob, F.R.C.S., 15, Upper Brook-street, W.

1881. Warner, Francis, M.D., 5, Prince of Wales-terrace, W.
1894. Waterhouse, Herbert Furnivall, F.R.C.S., 81, Wimpole-street, W.
1883. Waterhouse, William Dakin, LL.D., 18, Woodchurch-road, West Hampstead, N.W.
1872. Waters, John, M.R.C.S., 41, Bloomsbury-square, W.C.
1891. Watson, W. Spencer, F.R.C.S., 7, Henrietta-street, Cavendish-square, W.
1889. Waugh, Henry Dunn, M.D., 6, Sumner-place, Onslow-square, S.W.
1884. Webb, F. Ernest, M.R.C.S., 113, Maida-vale, W.
1889. Weber, Hermann, M.D., 10, Grosvenor-street, W.
1887. Webster, Henry William, M.D., St. George's Infirmary, Fulham-road, S.W.
1838. *Wells, John Robinson, F.R.C.S., 4, Pierrepoint-road, Acton, W. c 2.
1884. West, Samuel, M.D., 15, Wimpole-street, W. s 2, c 4, cfc.
1889. Wethered, Frank Joseph, M.D., 34, Queen Anne-street, W.
1892. Wheaton, Samuel Walton, M.D., 52, The Chase, Clapham Common, S.W.
1882. Whipham, Thomas T., M.D., 11, Grosvenor-street, W. sm, c.
1884. Whistler, William MacNeill, M.D., 17, Wimpole-street, W.
1889. White, E. F., F.R.C.S., Westlands, 280, Upper Richmond-road, Putney S.W.
1868. White, Joseph, F.R.C.S. Edin., 6, Southwell Gardens, Kensington, S.W.
1880. *White, William Henry, M.D., 43, Weymouth-street, W. c. 3.
1885. White-Cooper, George Owen, M.B., 5, Cranley-gardens, S.W.
1883. Whitehead, Walter, F.R.C.S. Edin., F.R.S.E., 499, Oxford-road, Manchester. c.
1885. Whitla, William, M.D., 8, College-square North, Belfast, Ireland.
1877. Whitmore, William Tickle, F.R.C.S. Edin., 7, Arlington-street, Piccadilly, W.
1872. Williams, Charles Theodore, M.D., 2, Upper Brook-street, Grosvenor-square, W. p, vp 2, ll, s 2, sm, o, l 3, c 9.
1876. Williams, Henry William, M.D., Hillside, Guilsborough, Northampton.
1883. Williams, Sir John, Bart., M.D., 63, Brook-street. c 3.
1883. Willis, Arthur Keith, M.A. Oxon., Gascony House, West End-lane, N.W.
1881. Wills, Caleb Shera, C.B., Brigade Surgeon, Lunecliffe, Lancaster.
1873. Wills, Thomas Munns, F.R.C.S.I., J.P., 44, Merton-road, Bootle, Liverpool.
1893. Wills, William Alfred, M.D., 23, Lower Seymour-street, W.
1892. Wilson, Claude, M.D., Belmont, Tunbridge Wells.
1884. Winslow, H. Forbes, M.D., 14, York-place, Portman-square, W.
1873. Winslow, Lyttleton Stewart Forbes, M.B., D.C.L., 33, Devonshire-street, W. c.
1876. Woakes, Edward, M.D., 78, Harley-street, W.

1882. Wolfenden, Richard Norris, M.D., 35, Harley-street, W.
1886. Wood, T. Outterson, M.D., 40, Margaret-street, Cavendish-square, W. c 3.
1873. Woodhouse, Robert Hall, M.R.C.S., 1, Hanover-square, W.
1889. Woolfson de, Louis E. G., 26, St. John's-hill, Shrewsbury.
1891. Woollett, Charles Jerome, F.R.C.S., 35, Telfourd-avenue, Streatham-hill, S.W.
1886. Wordsworth, William John, M.R.C.S., 4, Tisbury-road, West Brighton.
1884. Wyman, William Sanderson, M.D., Red Brae, Putney-hill, S.W. c 2.

1891. Yarr, Michael Thomas, Surgeon-Captain, Medical Staff, Junior Army and Navy Club, St. James's-street, S.W.
1884. Yeo, I. Burney, M.D., 44, Hertford-street, Mayfair, W.
1884. Younger, Edward George, M.D., 19, Mecklenburgh-square, W.C.

NON-SUBSCRIBING FELLOWS.

1868. Bateman, Sir Frederic, M.D., J.P., Upper-street, Giles-street, Norwich.
1868. Beatty, Thomas Carlyle, Seaham Harbour, Durham.
1872. Bell, John Hougham, M.D., Leconfield, Bonchurch, Isle of Wight.
1868. Buckle, Fleetwood, M.D., Staff Surgeon R.N., Merton Lodge, Southsea.
1868. Child, Edwin, New Malden, Surrey.
1870. Clouston, Thomas Smith, M.D., Royal Asylum, Morningside, Edinburgh. FM 1870.
1863. Fletcher, Thomas Bell Elcock, M.D., J.P., 8, Clarendon-crescent, Leamington.
1863. Folker, William Henry, F.R.C.S., Hanley, Staffordshire.
1869. Foster, Sir Walter B., M.D., M.P., 14, Temple-row, Birmingham.
1868. Fox, Charles Henry, M.D., Brislington House, near Bristol.
1868. Fox, John Makinson, The Grove, Lymm, Cheshire.
1868. Gaine, Charles, 30, Gay-street, Bath.
1871. Glynn, Thomas Robinson, M.D., 62, Rodney-street, Liverpool.
1872. Harris, Henry, LL.D., M.D., Redruth, Cornwall.
1868. Kirkman, William Phillips, M.D., Elphinstone-road, Hastings.
1868. Knaggs, Samuel, Ebor Mount, Huddersfield.
1869. Lees, Charles Alexander, M.D., Dep. Inspector-General, R.N.

1869. Lipscomb, John Thomas Nicholson, M.D., St. Albans, Herts.
1869. Lunn, William Joseph, M.D., Hull.
1859. Marshall, James, M.D., 6, Rubislaw-place, Aberdeen.
1869. Mathews, Robert, Bickley, Kent.
1871. Maurice, Oliver Calley, 75, London-street, Reading.
1862. Maybury, Augustus Kingston, M.D., Holly Lodge, Richmond, Surrey.
1868. McIntyre, John, M.D., LL.D., Odiham, Hants.
1868. Nevins, John Birkbeck, M.D., 3, Abercromby-square, Liverpool.
1871. Ogle, William, M.D., The Elms, Derby.
1869. Pemberton, Oliver, F.R.C.S., J.P., 65, Temple-row, Birmingham.
1869. Philipson, George Hare, D.C.L., M.D., J.P., 7, Eldon-square, Newcastle-on-Tyne.
1869. Price, William Preston, M.D., 1, Ethelbert-crescent, Margate.
1869. Prior, Charles Edward, M.D., St. Peter's, Bedford.
1869. Roberts, Bransby, M.D., Badlesmere House, Eastbourne.
1871. Sloman, Samuel George, Farnham.
1869. Stear, Henry, Saffron Walden, Essex.
1869. Taylor, Charles Bell, M.D., 9, Park-row, Nottingham.
1869. Walker, John Swift, M.D., Hanley, Staffs.
1869. Webster, Frederick Richard, St. Albans, Herts.
1868. Wiblin, John, F.R.C.S., Clewer, Windsor.

*** As it is very desirable that the List of Members should be kept as accurately as possible, Fellows are requested to send notice of any corrections that may be necessary to the Secretaries or to the Registrar.

GENERAL MEETING.

March 5th, 1894.

SIR WILLIAM B. DALBY, F.R.C.S., President, in the Chair.

Annual Report of the Council presented at the General Meeting of the Society, March 5th, 1894.

THE Council begs to submit the following Report for the past session.

The average attendance at the meetings has been better than in recent years. The Clinical Evenings have fully maintained their interest, but the Secretaries still experience some difficulty in providing a sufficient number of suitable medical cases.

The Oration of Mr. Mitchell Banks on "Physic and Letters," was of an unusually high order, and was much appreciated. The greatest interest was also manifested in Mr. Frederick Treves's Lettsomian Lectures on "Peritonitis."

The Anniversary Dinner, presided over by Mr. Jonathan Hutchinson, was in every way a success.

The total number of Fellows on the roll is 762, of whom 591 are Subscribing Fellows. Twenty-six new Fellows have been elected, and three former Fellows have been re-admitted into the Society. Six resignations took place during the year, and the Council has to deplore the loss, by death, of six Fellows, amongst whom special reference must be made to their distinguished Past President, Sir Andrew Clark, and to their Honorary Fellow, the eminent Professor Tyndall.

Vol. XVI of the Transactions was duly published, and will bear comparison with any of its predecessors; it includes the address on "Neurology and Therapeutics," by Dr. W. R. Gowers, the first recipient of the Fothergillian Medal under the new scheme for its adjudication.

The finances of the Society continue satisfactory. The various alterations in the Society's leasehold premises, referred to in the last Report, are still in progress, but will be completed in the course of a few months. In this connexion the best thanks of the Society are due to the House and Finance Committee, and especially to its Chairman, Mr. D. H. Goodsall, for the unremitting attention he has bestowed on the arduous and often trying duties of that office.

The Laws' Revision Committee has held several meetings, and it is probable that the Report will very shortly be presented to the Council.*

Owing to indisposition the President was, on several occasions, unable to preside over the meetings of the Society, and the chair was ably filled by one or other of the Vice-Presidents.

* *Vide ante*, p. v.

Dr. THE MEDICAL SOCIETY OF LONDON.—BALANCE SHEET, 1893–94. Cr.

1893, Feb. 1 to 1894, Jan. 31	Receipts.	£	s.	d.
	To Balance from last Account	82	2	10
	,, Life Composition	15	15	0
	,, Subscriptions (including Arrears)	540	14	6
	,, Entrance Fees	27	6	0
	,, Rents	745	11	6
	,, Contributions for use of Rooms	30	9	0
	,, Sale of Transactions	1	5	0
	,, Loan from Bankers	300	0	0
		£1743	3	10

1893, Feb. 1 to 1894, Jan. 31	Expenditure.	£	s.	d.
	By Rent, Gas and Electric Light, Coals, Rates, Taxes, and Insurance	492	2	10
	,, Repairs	45	4	4
	,, Library Expenses	33	0	3
	,, Salary, Allowances, and Collector's poundage	139	4	8
	,, Reporter	2	2	0
	,, Printing and Stationery	11	1	10
	,, Printing and issuing Transactions, Vol. XVI	129	0	10
	,, Postage	9	19	3
	,, Interest on Debenture Bonds	81	12	9
	,, Wages	46	8	0
	,, Miscellaneous Expenses, including Refreshments at Meetings, Band at Dinner, Chandlery, and Cleaning	42	14	8
	,, Conversazione	45	13	1
	,, Building and Alterations to Society's Premises—			
	Cost of new Cellarage. 561 2 10			
	Payment on account of Architect's Fees 100 0 0			
	Interest on Loan from Bankers 1 4 7			
		662	7	5
	,, Balance at Bankers	2	11	11
		£1743	3	10

FOTHERGILLIAN FUND.

	£	s.	d.		£	s.	d.
To Balance in Bank from last account .	136	0	2	By Gold Medal and Premium awarded to Dr. W. R. Gowers, F.R.S. . . .	63	0	0
,, 1 year's Div. on £916 10s. 5*d.*, 2¾% .	25	4	0	Purchase of Books for Library . .	24	12	7
				Balance at Bankers	73	11	7
	£161	4	2		£161	4	2

(Signed) ARTHUR E. DURHAM, *Treasurer.*

February 16th, 1894. Audited, compared with vouchers, and found correct,

(Signed) A. BOYCE BARROW, FRANCIS HAWKINS } *Auditors.*

The Registrar, Mr. Hall, has continued to discharge his various duties in a manner which leaves nothing to be desired.

In conclusion, the Council desires once more to place on record its gratitude to the Hon. Treasurer, Mr. Arthur E. Durham, and to the Hon. Librarian, Dr. Allchin, for the unceasing care and attention which they continue to devote to the discharge of their respective offices.

Honorary Librarian's Report.

Session, 1893–94.

I have the honour to report that during the past year 184 volumes have been added to the Library, of which 31 were presented by the authors or publishers.

The Library continues to be increasingly used by the Fellows of the Society, especially as regards the loan of books.

It is with much regret that I again have to announce the very slight progress made with the cataloguing and arranging of the old books, due to the disturbance of the Library by the building operations, which almost entirely prevented any work during the autumn vacation—the only time in the year when the rooms are sufficiently disengaged to permit of any continuous work. It is much to be hoped that after more than 10 years' constant upset and interference this most important department of the Society will now be permitted to attain to more completeness of arrangement.

Thanks to special donations which I have received from Sir Richard Quain, Bart., and from Past Presidents Dr. Hughlings Jackson and Sir William MacCormac, together with a small contribution from the Council, a further advance has been made in the rebinding and repairing of the 17th century books to the extent of 89 volumes, but a very considerable amount is still required to complete this much needed work.

The Library Committee has met as usual to select books for purchase, and to consider other matters connected with the Library.

It is my pleasing duty again to express the indebtedness of the Society and myself to Mr. Hall for his zealous and obliging services, which include not only the ordinary duties associated with the work of the Library, but also the cataloguing of upwards of 300 volumes of the old tracts—a labour carried out under conditions of considerable difficulty.

(Signed) W. H. Allchin,
Hon. Librarian.

TRANSACTIONS

OF THE

MEDICAL SOCIETY OF LONDON.

121ST SESSION.

October 16th, 1893.

OPENING ADDRESS: ON THE INFLUENCE OF EXTREME SLOWNESS OF PULSE IN THE CAUSATION OF EPILEPTIFORM CONVULSIONS.

By the President, JOHN SYER BRISTOWE, M.D., F.R.S.

THE subject to which I purpose addressing myself this evening is one of much clinical interest, to which my attention has been directed for many years past, but on which, so far as I know, little has been written, on which scarcely any light has been thrown by either clinical or pathological investigation, and to which I must confess I can contribute little beyond the simple narrative of three typical cases that have come under my observation.

The earliest recorded cases that I know of appeared in the first volume of the 'Lancet' for the year 1885. The first in order was one by Mr. F. St. George Mivart, published in the number for January 3. The patient was a man aged 61, who for six years had been liable at intervals to slight epileptic seizures; and who, during the period he was under observation, had a pulse-rate which varied between 20 and 26 in the minute. He was described as anæmic, as having a slight (apparently systolic) murmur at the base of the heart, and a soft systolic bruit, like a prolonged first sound, at the apex. The urine contained a trace of albumen.

Mr. Mivart's conclusion was that "the seizures were simply swoons, modified by the patient's epileptic tendency."

The second case was one reported in much detail by Dr. A. T. Gibbings in the 'Lancet' for February 14. The patient was a tall, spare man of 66. He had worked hard at his office; had had a good deal of worry and anxiety in domestic matters; and his pulse had been liable to frequent intermissions as long as he could recollect. He first consulted Dr. Gibbings in May, 1882, for weakness, attacks of dyspnœa induced by exertion, but coming on also in the night, and a troublesome morning cough. His heart was free from murmur, intermittent, but beating about 60 in the minute, and his urine was free from albumen. He continued ill for some months, but was able to return to business on the 21st November. On the 2nd December, Dr. Gibbings was again requested to see him, and was struck with the fact that his pulse was now only 44 in the minute, but quite regular. He grew steadily worse, and on the 3rd January, 1883, was seen in consultation with Sir Andrew Clark. He complained of dyspnœa on the least exertion, and of frequent feelings of faintness, and his pulse was regular and only 34. Subsequently the pulse (continuing regular) became slower and slower, the feelings of faintness much more frequent, and then associated with epileptiform attacks. The face became deadly pale, the pupils dilated, and the eyes fixed; the pulse ceased to be felt at the wrist. After a few seconds it returned feebly, the face then flushed all over, and clonic convulsive tremors lasted for five or six seconds. The first indication of an attack was the non-recurrence of the usual pulse beat. He generally had an aura consisting in a feeling of hot fluid at the back of the neck. On the 20th January he was seen in consultation with Dr. Moxon. After this the patient became much worse, the fits became distressingly frequent, and apt to be brought on by the slightest exertion. His pulse became slower (but still regular), and on January 28 was counted at 12 in the minute. Henceforth it varied between 15 and 31, and curiously the rate appeared to increase as the end approached. After February 26th he seemed to improve, and he got up and worked at his books for two or three hours a day. But he still suffered from dyspnœa on exertion, his pulse, however, beating at the rate of 30 to 34 in the minute. On March 6 while at stool he fainted, and died in two or three minutes. It may be added that his intellect was always

clear, that his heart was of normal size and free from murmur, that his temperature was always subnormal, never, indeed, rising to 98, and that (excepting for the presence of albuminuria for a few days in February) his urine was always healthy. At the *post-mortem* examination, at which Dr. Moxon was present, the heart and all the organs were found apparently perfectly healthy. There was, however, about a pint of serous fluid in the right pleura.

Dr. Gibbings, in discussing the above case, attributes, and I think rightly attributes, the epileptic attacks to anæmia of the brain brought about by the slow action of the heart—assuming (as I understand him) that the fits were directly due to intermissions in the heart's action occurring at moments when the heart's beats were unduly slow; and he suggests that the slow action of the heart was caused either by some irritative lesion of the vagus or some degenerative lesion of the cardiac ganglia.

The third case appeared in the 'Lancet' for March 7, and is one which I contributed. Curiously, while the first two cases have frequently been quoted, my case has been largely, if not entirely, overlooked. Yet, while in the main agreeing with the other two, it presents one or two additional interesting features. The case is not a long one, and, as it seems to have been wholly forgotten, I will venture to quote my communication to the 'Lancet' word for word.

"The interesting case narrated by Dr. Gibbings in your issue of February 14 reminds me of one, the notes of which I have long had by me with the object of publishing whenever a suitable occasion should present itself. I was much interested in it because it seemed to me to show conclusively the effect of cerebral anæmia in the causation of epileptic or epileptiform attacks.

"The following is a copy, with only a few verbal alterations, of the case, as I wrote it out at the time:—

"W. P., aged 31, was admitted under the care of the late Dr. Goolden on May 4, 1869. He had been a soldier, and was in India for four years, during which time he contracted syphilis and suffered from 'fever and ague,' and was discharged after twelve years' service on account of 'weakness of constitution.' He has never had rheumatism, and never suffered from shortness of breath or palpitation previously to his present illness. This came on two weeks before admission. At that time, under some mental

excitement, he jumped over some palings in order to prevent a fight. He was immediately attacked with faintness, but recovered from it very shortly. The next morning he woke up with heavy breathing, which also soon subsided. In the evening it returned, and he had a fit in which he lost consciousness. From that time he has had to give up work, and attacks of dyspnœa, followed by losses of consciousness, have occurred frequently night and day up to the time of admission. The fits have all been preceded by 'faintness at the chest,' followed by flushings, on the occurrence of which insensibility has supervened. He once bit his tongue slightly. He has had no pain in the chest or elsewhere. He was ordered to take quinine and iron and two glasses of wine daily. 14th.—I saw him to-day for the first time, and learnt that almost constantly since admission his pulse had been beating very slowly, sometimes not more than 26 in the minute, and that he had had frequent fits night and day. These had been of very short duration and attended with a little struggling. He had been carefully watched by some of the advanced students in some of these fits. And, according to them, it seemed clear that the fits always came on at the end of an unusually long interval between successive cardiac beats; that while the pulse was at the rate of one beat in three seconds, or even four seconds, no fit occurred, but that whenever, and only when, the intermission was prolonged to five seconds, a fit followed at the end of that period. 'He is free from fits this morning, and his pulse is beating regularly at the rate of 26 in the minute. There is a loud roaring systolic murmur above and to the right of the apex, and prolonged thence to the base.' 18th.—'No fit from the 14th to the 17th; but since the middle of yesterday, and especially during the night, the fits have been very frequent. They vary in length, but insensibility only lasts for a few seconds. He becomes very pale before each fit, then flushes, and while insensible his hands twitch a little. When I saw him the fits had ceased, but the pulse was very irregular. A few regular beats at the rate of 80 in the minute were followed by one or two beats occurring at intervals of about three seconds. Systolic murmur loudest towards the base. A little later his pulse was quite regular at the rate of 80 per minute. On listening to the heart it is found that its pulsations correspond accurately to the pulsations at the wrist; but between all the beats (attended with sound and perceptible at the wrist) separated from one

another by intervals of between two and four seconds, there are one, two, or three slight impulses of the heart distinctly to be felt, and seen by the imparted movements of the stethoscope. These latter beats are wholly unattended by cardiac sound or pulsation in the arteries. It seems to me that the action of the heart is quite regular as to rhythm, but that many of its beats are ineffectual. These intermediate impulses are felt at the base of the heart. Are they due to the action of the auricles or to the hardening of a relaxed but empty ventricle?' 25th.—'Has been pretty free from fits, but had a slight one last night; slept well, felt better. Pulse about 80, but irregular. Murmur loudest and roughest towards the base.' 28th.—'No fits, but occasional sensations as if they were coming on. Pulse 58, regular.' June 1.—'No fits; pulse 72, occasionally a little irregular; murmur as before; complains of pain in left shoulder, running down inner side of the upper arm.' 4th.—'No fits; pulse 72, quite regular; feels much better.' 8th.—'No fits, but pulse irregular; murmur as before; feels well.' On this day he left the hospital, but he attended as an out-patient until the 21st. During this time, though his pulse continued to be somewhat irregular, he remained free from palpitation, shortness of breath, and fits; and expressed himself as feeling fairly well. I never heard of him subsequently."

I added to my report on this case, in my letter to the 'Lancet,' that I had not recorded, and did not recollect, what my original views had been with respect to its morbid anatomy, but that I was now inclined to suspect that the cardiac disease was syphilitic. Of course this suspicion may have been correct, but my views as to the significance of cardiac murmurs have undergone considerable changes during the last few years, and I confess I am now quite prepared to believe that the murmur was not due to the presence of any organic valvular disease. I may further add, in relation to the case, that the fact that the epileptic seizures came on only at the end of a cessation of the pulse for five seconds was repeatedly verified, and not only by the finger on the radial artery, but also by listening to the sounds of the heart; and that the only treatment adopted was that of the exhibition of tonics, with good feeding, the moderate use of stimulants, and absolute rest in bed.

The second case of the kind that came under my observation occurred two-and-twenty years later in the person of a patient of

Dr. John Ferrier's, of South Norwood, whom I saw in consultation with him on the 20th November, 1891.

The patient was a widow, 54 years of age, who had a healthy grown-up family, and who, until recently, had enjoyed uninterrupted good health. For the last ten years she had been liable to feel faint in hot and crowded rooms. In the winter of 1889–90 she was laid up for some weeks with pain and swelling in the legs, which was said to be caused by inflammation of veins. In the winter of 1890–91 she was again laid up for several weeks with severe pains in the joints, but no swelling. Her illness was called rheumatic fever; she complained at the time of some uneasiness in the region of the heart, which was said to be weak and to present a "valvular leak." During the summer of 1891 she kept fairly well. In the beginning of September she had a "giddy attack" and nearly fell to the ground. On coming to she did not at first know where she was.

On the 23rd October she first came under Dr. Ferrier's care. About 9.30 P.M. she had a giddy attack, and fell in the hall, cutting the back of her scalp. The bleeding was rather profuse, and the wound had to be stitched. It was observed that her ankles were œdematous; that the pulse was weak and slow, probably about 50 in the minute (but no note was made at the time); and that there was no cardiac murmur. The wound healed quickly and well. On the 28th October she complained of great pain in the muscles of the legs; but there was no swelling of the joints or pyrexia, and only a little œdema of the ankles. She was treated with small doses of salicylate of soda, and soon got well. On the 17th November there was some return of muscular pain; but, as her circulation seemed feeble, she was treated with iodide of potassium and liquid extract of cinchona.

At 11.30 P.M., on the 19th, Dr. Ferrier was summoned to see her. He found her suffering from epileptiform convulsions, which had been coming on about every half-hour. These continued, but diminished to one every hour or two hours during the night. She had vomited after the first, and occasionally vomited after the others. The attacks, which lasted only a few seconds each, were attended with pallor, cessation of respiration, loss of consciousness, and slight convulsions. The beats of the heart (as determined by the stethoscope) were, for the most part, at the rate of about 30 in the minute.

November 20.—During the greater part of the day the beats of the heart were about 17 in the minute. The fits continued at the rate of about one every half-hour. There was no cardiac murmur, but the urine was slightly albuminous.

At 5 P.M. I saw her, in consultation with Dr. Ferrier. When I entered the room she was just recovering from an attack, and breathing heavily; but some seconds elapsed before she spoke or knew what was going on. At this time the pulse was fairly regular, and varied between 108 and 120 in the minute, but shortly afterwards it fell to 20, and then to 18. It was then somewhat irregular, and the intervals between successive beats were not infrequently fully seven seconds. I counted by simultaneously keeping my finger on the radial pulse and listening to the heart through the stethoscope. During the long intervals of absence of pulsation I did not hear, see, or feel any abortive beats of the heart. The pulse was weak and soft; occasionally a very slight systolic murmur could be heard at the apex. I did not myself detect any evidence of brain, lung, or kidney disease. There was still slight œdema about the ankles. The temperature had, for the most part, been subnormal.

The pulse continued slow, the epileptiform attacks increased in frequency, and, during the greater part of the night, occurred nearly every 10 minutes. At about 5 A.M., on the 21st, the fits ceased, mucous *râles* developed, and she died quietly at 8.30 A.M.

She was treated mainly with stimulants, and a mixture containing ammonia, tartrate of iron, nux vomica, and belladonna.

In this case, as in my first, the variations in the pulse rate were considerable; but Dr. Ferrier was quite satisfied that the epileptic seizures occurred at times when the pulse was acting very slowly. The actual length of the pause prior to the coming on of a fit was, unfortunately, not determined. And it is curious that, although I was with the patient for a considerable time, no fit occurred during this period; and yet the duration of the pause was several times proved to be exactly seven seconds, a pause which, if recurring regularly, would make the rate of the pulse per minute as nearly as possible $8\frac{1}{2}$.

My last case is one which I had not the privilege of seeing or examining during life. But on the 8th February of this year I went down to the hospital about the time at which *post mortems* are made, and was told by the Resident Assistant Physician that

a case was about to be examined which might be of some interest to me.

The following is a brief history of the case, for which I am mainly indebted to the clinical clerk, Mr. W. Watkins Pitchford, who had taken, from the beginning, a very intelligent interest in the case.

The patient was a mill-sawyer, 49 years of age, who was admitted into St. Thomas's on the 7th January, 1893. He appeared to have been a healthy man down to about two years previously, when, for a period of six weeks, he suffered from fits. He recovered from these and remained well until six months ago, when the fits recurred, and troubled him ever afterwards. He stated that the fits began with giddiness, that he became unconscious, and, if standing, fell; that they lasted for a few seconds each, and that on becoming conscious he felt perfectly well. He added that the fits sometimes recurred every three or four minutes for hours together.

He was a spare, but healthy-looking, man. There was no cardiac dulness. The sounds at the base were faint but healthy; at the apex the first sound had a blowing character, and the murmur was conducted into the axilla. The radial arteries appeared to be thick and rigid, but straight; the brachial were tortuous. The pulse, on admission, was regular, but varied between 25 and 30 in the minute. There were some signs of emphysema in the lungs. The liver dulness extended nearly to the umbilicus, but the edge of the organ could not be felt. Urine 1012, acid; no albumen. Arcus senilis present; pupils equal and natural. Reflexes normal.

On January 9th it was noted that he had had four fits since admission. The pulse about the time of the fits was 22, but after one of them it rose to 40. From this time to the 31st he seemed to improve, and expressed himself as feeling fairly well. On that day, at the time the pulse was being felt (and it was acting regularly and at the rate of 72 in the minute), it suddenly stopped for five seconds, at the end of which time he became livid and unconscious, and slightly convulsed. He then recovered with a cry, and his pulse went on at a quickened rate. At this time a trace of albumen was found in the urine.

After this the fits became more numerous, at first two or three a day, but in the course of a few days almost incessant—at intervals of three or four minutes only. It is stated, however, that

they never occurred during sleep; but the terror into which their repeated occurrence threw him interfered much with his sleep. Although in one of the attacks above recorded a fit came on whilst the pulse was beating generally at the rate of 72 in the minute, it was observed, almost without exception, that as a rule when fits were occurring frequently the pulse was between 25 and 24; but that a pulse rate of 20 per minute was often maintained for hours without the supervention of fits.

The fits resembled one another almost accurately. The pulse at the wrist would stop; then the patient would become insensible and his face deadly pale, and his eyelids would close, while his eyelids, fingers, and hands would tremble slightly. Then, after a period of about three seconds, his face would flush deeply, the pulse would be re-established at its former rate, his eyes would open, he would utter a deep sigh, and almost always express the greatest terror at what had occurred. The temperature of the patient during his residence in the hospital was always either sub-normal or normal.

The patient was kept in bed, and treated at various times with strychnine, and large doses of ammonia and ether, but without effect. Bromide of potassium in large doses benefited him by giving sleep; as also, according to the patient's feelings, did hypodermic injections of chloral and opium.

He died in a fit on the 7th February.

Post mortem.—Body well nourished. No œdema of extremities. Left pleura held half-a-pint of clear fluid. Right, old adhesions over upper lobe. Lungs emphysematous; œdema of lower lobes. A calcified nodule embedded in fibroid tissue at right apex.

Pericardium healthy. Heart weighed $15\frac{1}{4}$ oz., presenting considerable hypertrophy of the left ventricle, its cavity being apparently unaltered. Probably also some hypertrophy of left auricle, of which the endocardium was white and opaque. Right side of heart normal. Muscular tissue healthy. All the valves were competent, but there was a little atheroma of aortic flaps, and one atheromatous spot on a mitral flap.

There was a little atheroma with some calcification in first inch of aorta, with a ring round the mouth of each coronary artery. The first inch of the left coronary artery showed a little atheroma; but the rest of this and the whole of the right were healthy. There were only a few spots of early atheroma in the course of the

thoracic and abdominal aorta. The radial arteries were atheromatous and calcareous.

There was no external sign of gout; but a little deposit of urate of soda was found in both big-toe joints.

The kidneys were large ($12\frac{3}{4}$ oz.), deep red, and unduly firm, and the capsules were a little thickened; but there was no clear evidence of the presence of any serious disease.

The liver showed no signs of disease, and was free from any trace of the nutmeg character. Spleen large and firm. Peritoneum and all other abdominal viscera healthy.

There was considerable œdema over vertex of brain; but there was no other intracranial change, beyond atheroma at origins of both middle cerebrals and in both vertebrals.

It may be added, that the amount of disease in the arterial system was only slight, excepting in the case of the radial arteries.

I do not intend to comment at any length upon the above cases. It will be admitted that they are rare, for very few, so far as I know, have been recorded; and, although I had been on the look-out for such cases ever since I met with my first, now more than 24 years ago, I never met with another until January, 1891, and my last would probably have been overlooked as a case in point, but for the accidental circumstance that I attended the *post-mortem* examination, and, guided by the notes of the case, was enabled by questioning those who had had charge of it, to satisfy myself of the accuracy of certain important statements, and to elicit some additional facts.

That the fits in all such cases are epileptiform in character is the opinion of all medical men who have witnessed them; at the same time there is little, if anything, to distinguish them from momentary and sudden faints, in which also the patient becomes pale, and momentarily insensible, and slightly convulsed, and, if standing at the moment of attack, falls as if shot. These latter considerations have led me to wonder if pauses in the action of the heart, sufficiently long to cause fainting or epileptiform attacks, may not be of much more frequent occurrence than many of us, at any rate, have been led to suppose; whether, in fact, if we were to happen to feel the pulse (or, better, to listen to the heart) immediately before the occurrence of a faint, we might not often find that the faint was preceded by such a pause as has been above

described. But such an opportunity can only very rarely present itself.

It is impossible to say what is the longest pause a patient can endure without the occurrence of an epileptiform attack. From the first case that came under my observation, I was disposed to think it was five seconds, a view to some extent confirmed by my third case. But in my second case I observed pauses of seven seconds duration without the supervention of a fit.

It is interesting that in all the recorded cases the pulse had a tendency to be very slow, often beating, when there was no fit, at the rate of from 20 to 30 in the minute. At the same time, it is important to note that in some cases the pulse would rise to 70 or even 120 in the minute after an attack, or would be generally fairly rapid.

I will conclude this address with a quotation of the last paragraph of my letter to the 'Lancet,' which has reference to another subject, but one which the earlier part of my letter brought to my memory:—

"It may be interesting, in relation to the above case" (namely, the first of my own cases), "to record another in which similar epileptiform fits were the consequence of the opposite condition of temporary cerebral congestion. About 10 years ago I was consulted by a gentleman, 60 years of age, who was very fat, and had been liable to bronchitis for many years. For several weeks, or longer, he had been suffering from severe prolonged paroxysmal attacks of cough with whooping inspiration, in the course of which he frequently became insensible, and slightly convulsed for a few seconds. In my consulting room one of these paroxysms of cough came on. It was much like an attack of whooping-cough, and after it had lasted for some time (half a minute or a minute) respiration suddenly ceased; he became increasingly livid in the face, his head fell upon his chest, and he was insensible and slightly convulsed for a few seconds. He then came to, and appeared in his usual condition. Whether he was really suffering from whooping-cough or not I do not know. I could not determine that point at the time; but I know that these phenomena continued unchanged for some considerable time after his visit to me, and that even during the next five or six years he still occasionally whooped, and still occasionally lost consciousness during severe attacks. I saw him again about six years later, when he was suffering

from the effects of advanced bronchitis, and about a month before his death from this disease. Attacks like the above are not uncommon, and occasionally cause death in children suffering from whooping-cough; but, so far as I know, they are rare in adults."

GRAVES'S DISEASE.

By Arthur Maude.

Mr. President and Gentlemen,—I propose to touch on certain points in exophthalmic goître or Graves's disease.

The first is the importance of the thyroid enlargement.

The belief is an established one, that the disease may exist (and frequently does) without any goître, and there are plenty of statistics of the proportion of cases in which goître occurs. Having for some years taken great interest in this condition, I have had a routine custom of always examining the thyroid in all cases of anæmia or cardiac disturbance at every interview. The result has been that I have detected several cases of Graves's disease in an early stage, and my diagnosis has been verified by the onset of other marked symptoms pertaining to that condition. I have had 15 cases under my care in the last five years: it is not a large number, but the conditions of my work have enabled me to watch them more closely and for a longer period than, probably, any other series of cases has ever been watched, for it is impossible in hospital or consulting practice to follow patients as I have done. My observation is a positive one, and therefore worth many negatives, that every person has presented variations in the size of the thyroid from the earliest complaints of any cardiac symptoms. This variation has been in several very slight at first, no more than many women show, if the neck is carefully examined, when in perfectly good health. I prefer, therefore, to call it a "variation in the size of the thyroid" than a goître. However, in all these 15 cases, if a large goître was not present at first it developed later.

All my patients have been women.

One case I have watched with peculiar care—seeing her con-

stantly for five years, and almost daily for months together. She had for two years constant variations in the size of the thyroid: it was never much enlarged during that time, but was never the same two days running, and occasionally I found it vary almost from hour to hour. Without such continuous observation she might easily have been described as having no goître, for she had not noticed it herself.

I do not press this prevalence of bronchocele as an ætiological factor in the production of Graves's disease in my part of the country, the more so because there are two factors tending to produce neuroses, which are worth attending to, and which are both in full force round me.

1st. In America there is a growing opinion that neuroses are particularly common in parts of the country where a quiet rural life is being rapidly exchanged for a more active, highly competitive civilisation, where frequent trains, posts, and telegrams have been rather suddenly introduced.

2ndly. In country villages the milder imbeciles, the feeble intelligences sprung of neurotic families, always marry with other imbeciles of like lineage, because no other girls will look at them. I know a young man whose father is a drunkard, whose mother and aunt were half-witted, who had one brother a suicidal melancholic, and another epileptic; he must needs marry an hysterical girl whose mother has hystero-epilepsy of a well pronounced type, whose aunts are two of them very hysterical, and a third has Graves's disease, and the latter has several feeble-witted children, one of whom is epileptic. This well-selected pair have children: I could produce dozens of such cases. These feeble-minded neurotic young women in villages get married to the exclusion of better girls, because in many cases they are seduced and the seducer is forced by public opinion to marry them. This factor in the production of neurotic offspring is not at work in towns, for social and economic reasons on which we need not touch here.

It is interesting to enquire whether Graves's disease is on the increase. On this point the opinion of this Society should be of value. The figures of admission to St. Bartholomew's Hospital, as an example, show that from 1870 to 1880 only 17 cases were admitted, but from 1880 to 1890 53 cases came in. This may be due merely to a better recognition of the disease on the parts of house physicians and others.

The Registrar-General, unfortunately, classifies all deaths from affections of the thyroid, except malignant and specific diseases, under the one head of "Bronchocele," but his figures are instructive, for they show that there has been a steady rise from 91 to 152 in the decade beginning with 1881. The increase of deaths has been almost entirely female, the male mortality averaging $22\frac{1}{3}$ and increasing from 21 steadily to 26. Now, simple goître rarely kills, except by excessive thyroid enlargement, and such very large goîtres are rare in England. The presumption is, therefore, that the increase in death rate is due to Graves's disease, and this is supported by the increasing preponderance of female deaths. For there is no question that Graves's disease far more largely affects women, and though women are more liable than men to all thyroid affections, I am not aware that there is any evidence that they are becoming increasingly so liable.

Next, does Graves's disease never occur in previously goitrous subjects? Two years ago M. Lasvénes* published in detail three such cases, in which the persons had been goitrous many years. They are the sole records I can find. I have myself met with *seven* instances. I have known them all for years, seen them frequently, and devoted great care to the diagnosis, as the question is, to my mind, of great importance.

Case 1.—Married woman, aged 47. Goîtrous since 18 years of age. Examined carefully and often in 1887—1888, and decided to be a case of simple goître. Not till 1891 did she develop any real signs of Graves's disease, and these were then accompanied by various paralytic conditions of great interest. I have twice published an account of her, and shall allude to some of her symptoms later.

Case 2.—Married woman, 43. Goître first noticed early in 1888, probably due to constant use of water contaminated by cow-dung. A neighbour in the next cottage, using the same water, is also goitrous. Patient miscarried in November, 1891; immediately after she began to have severe palpitation, constant rapid pulse, and typical attacks of diarrhœa, while the goître increased largely.

Case 3.—Mrs. S——, 51. Goitrous for 14 years. Has had, during the last two years, an attack of cystitis, probably secondary to slight cystocele, and two attacks of influenza. For six months she had rapid pulse, severe palpitation, flushing, sweats, and tremor, while for a year afterwards I noticed marked retraction of the eyelids, so great as to expose the upper margin of the corneæ.

* 'Thèse de Paris,' 1891.

Case 4.—Mrs. P——, 54. Goître since marriage at 29 years old. In the last two years it has increased largely, though the water supply she uses is excellent. At the same time, she has developed frequent distressing palpitation, and a rapid and irregular heart. She has some dilatation of the heart; this, however, may be due, as may the other cardiac signs, to emphysema, which is present. But she presents, also, marked and typical tremor of hands and trunk.

Case 5.—Mrs. W. K——, 23, is the daughter of the last patient. One other sister is also goitrous; patient has had a large goître since childhood; for about two years has been subject to distressing palpitation, especially when startled, which she is very easily. Soon after marriage, last autumn, she suddenly developed a form of rhythmic spasms, which I shall describe briefly later on, and on watching her closely for some time I noted extreme palpitation and rapid pulse.

Case 6.—Mrs. A. S——, 52. Goitrous 15 years. For about two years her menses, previously natural, became irregular, prolonged, and profuse, with no objective cause discoverable. During this time she has become increasingly subject to severe palpitation and irregular rapid heart. She also presents marked retraction of the lids.

Case 7.—E. J——, unmarried, 37. Mother myxœdematous patient of weak intellect. Goître has existed since puberty. I have known her nearly seven years, and found no sign of Graves's disease till the autumn of 1892. Since then she has developed every sign of that disorder in an aggravated form.

I may say boldly, here, that in my opinion the value of the eyelid symptoms in Graves's disease has been much over-rated; that I find them common in many people in good health, and particularly common in neurotic subjects.

Next, the disease is said, on all hands, not to occur in districts where bronchocele is common, nor in the subjects of previous bronchocele.

I can find, however, nothing like statistics on either point. In wading through the vast bibliography of this disease, I am struck by the large number of cases reported in certain Western American States, possibly because the medical press is so prolific there; but in 1878 an Illinois physician* (Mr. Earle) asserted that it was very common in that State. Mr. Burton, of Cambridge,† thought it also very common in that county, where bronchocele is comparatively unknown, but where rheumatism and anæmia (the result of malaria) are very rife.

Again, though it is known in India among natives (we have Sir

* 'Brit. Med. Jour.', 1893. II. Epitome—21 (95). Tachycardia.

† Earle: 'Trans. Illinois Med. Soc.', 1878.

Joseph Fayrer's authority for that), it cannot be common, for I have these definite statements from ophthalmic surgeons, who, as we saw in 1886, do stumble across a good many cases. Mr. Drake Brockman,* of Madras, never saw one case during 15 years of practice there: Professor Perry, of Lahore, kindly informs me that he has never seen one in his large *clinique* there, and he adds that Professor Murray, of that city, has had the same experience; though both these gentlemen have huge numbers of goitrous Punjâbis continually in their hands.

Now, what is my own experience?

I live 20 miles from London, on the borders of Kent and Surrey, and I find I have made notes in six years of 55 cases of enlarged thyroid, out of a population which may be roughly estimated at 3,000 souls. When allowance is made for cases which will not have come under my observàtion this seems a high percentage of goître: but on that point I ask for opinion from some of you who are more widely informed.

Out of these 55 cases of enlarged thyroid, 12 are undoubted cases of Graves's disease, 9 of which I published a few years back, 5 more are ill-marked, "*fruste*," cases, to adopt the name that Professor Charcot's School have given them. The remaining cases are simple goître.

The figures are small, but even if they do not prove that Graves's disease is common among goitrous people, they certainly do not support the opposite assumption.

Now, of these cases, I regard only three as at all doubtful: they may be merely instances of paroxysmal tachycardia coming on in women approaching the menopauses, or under the nervous stress of recent marriage, as in one example, and the fact that they are goitrous may be purely accidental. Kisch has lately shown how common paroxysmal tachycardia is in women at such epochs. But the balance of evidence is in favour of all seven cases being exophthalmic goître.

The other four cases are undoubtedly exophthalmic goître. The only question with them is whether they had not exophthalmic goître all along; to that I can only reply that I have been for years looking for it, and that any special knowledge I may possess on the subject would be more likely to lead me to think that the

* 'Trans. Ophthalm. Soc.', 1886.

disease was present when it was not, than to overlook symptoms which were not well marked.

The last patient brings in another point, the connection of exophthalmic goître with myxœdema. She belongs to a highly neurotic family. Her mother, whose portrait I pass round, is myxœdematous, in an early stage, and the mother's thyroid has exhibited marked variations in size for some years. The two diseases here occur in two generations, but there is plenty of evidence that myxœdema is sometimes preceded by Graves's disease, and a reversal of this order has been described by Kovalevski,* in the case of a man having exophthalmic goître, who developed signs of myxœdema which disappeared after some months, while the symptoms of Graves's disease remained. This sequence of myxœdema to Graves's disease is of great practical importance, for if a surgeon performs extirpation of the thyroid in a case of Graves's disease and myxœdema ensues, it need not necessarily be the result of the operation. But, curiously enough, I can find no record of myxœdema ever having followed such an operation for this disease.

I collected last year† 20 cases of operation on the thyroid for Graves's disease. In 11 the whole gland was extirpated, with great improvement in all, and absolute recovery in several. One case remained well for 10 years. Half the gland was removed in two instances with great improvement, and in three the surgical treatment of cysts was attended by relief, but in one of these the symptoms recovered in a few years. In two cases, however, tetany ensued, and there was no relief.

In my list there was no fatality, but I learn, through the kindness of Dr. Hale White and Mr. Arbuthnot Lane, that a patient has recently died in London during this operation.

In spite of these apparently encouraging results no one could approach the operation of thyroidectomy in this disease without misgivings, and I do not mention the procedure to urge it as a remedy, but to point out that it is significant that surgical treatment of the thyroid does lessen or remove the symptoms.

* Kovalevsky : 'Arch. de Neurologie,' xviii, p. 422, 1889. Möbius : 'Deutsch Zeitschrift für Nervenheilk.', 1891, p. 423.

† 'St. Barth. Hosp. Rep.', vol. xxviii.

Part II.

I propose now, without touching on any of the cardiac or vascular disturbances, to draw attention to the alterations in nervous function, many of them very common, alterations which affect every part of the nervous system.

I shall attempt boldly to group the symptoms according to their probable seat of production, that is, under the three headings of brain, spinal cord, and peripheral nerve trunks, but this grouping must naturally be somewhat rough and experimental. First among the "encephalopathies" come *mental changes*. In only very slight, early cases are mental changes *absent*. In only one instance have I ever seen a uniform, sweet temper, and a natural turn of mind, maintained in established Graves's disease.

Pronounced insanity is rare; in fact quite lately one of the medical officers at Colney Hatch informs me that he thinks it must be very rare, because they have not seen a case there for a long while, and the opportunities at that asylum are large. Still, however, insanity does occasionally ensue, usually in the form of melancholia, and less often acute mania.

Dr. Savage suggested,* many years ago, that the peculiar appearance of the patient, from the staring eyes, may form the starting point of melancholia, by giving her the impression that she is being watched. This may be so occasionally, but I can attach no importance to it, because, as I say, some mental change is almost invariable, and not only exophthalmos, but even sufficient stare to attract constant attention is by no means so common as the name exophthalmic goître would imply.

The usual mind-disturbance is irritability, an excitable, restless turn of mind; and this I have found more than once associated with constant muscular restlessness; the patient is eternally fidgeting, playing with her mouth, her watch, her book; a condition which may persist for years. Besides this irritable state, I find two other mental conditions common—

1st. An over-sensitive notion of duty, which I have seen become

* 'Lancet,' 1890, i, p. 1055.

very marked in the cases of several middle class ladies of religious tendencies, a state of mind scarcely separated from religious melancholia, which would probably easily ensue.

2ndly. An incoherence of ideas, to which Dr. Russell Reynolds has applied the apt name of "chorea of ideas." One lady I know occasionally finds it impossible to pursue a train of thought without other ideas crowding into her mind; if she tries to write a letter, other names, and notions, and words, all real ones, crop up, instead of the one she wants. Another woman, who did a great deal of needlework, found that if she started to cut out a garment, half way she would be cutting out another sort of garment instead of finishing the first one. This differs from the enfeebled power of attention you find in neurasthenia, anæmia, or after acute disease, where the attention (or probably memory) simply strikes work. It resembles rather the mental state of mania or ordinary delirium. The links which connect impressions of memory are lost rather than the impressions themselves. At the same time ordinary loss of memory is very constant in Graves's disease.

Consciousness is rarely affected; I have seen such an instance once. A woman, whose curious paralytic symptoms I shall remark on presently, was fairly well when she received a shock at some accident to her son. She suddenly started out of the house to fetch me, and was running down the road when I accidentally met her; on my stopping her she seemed quite unconscious, did not know where she was, or who I was, and remembered nothing after starting from her house, though several people had spoken to her. Her state quite resembled that of ambulatory epilepsy.

I include tremor as a central symptom. If you ask me what is the feature of the disease next most common to the cardiac symptoms and the goître, I reply *tremor*. It is impossible to say much about it in the limits of this paper. It consists of fine vibrations of muscles, very small in amplitude, and very regular in time, the rate being always about eight or nine per second. The movement is usually most marked in the flexor muscles of the forearm, while the interossei and other muscles of the hand are not affected as they are in alcoholism; but if marked in the hands, it is also present in almost all other muscles of the trunk and limbs. I may

say here, that when I wrote on this subject a year ago,* I had never seen it in the muscles of the face, but, led by an observation of Dr. Sansom's, I have since found it affecting the masseters. This is important, as it negatives the theory that the tremor might be produced by spinal change.

The points on which I would lay stress in reference to this tremor are—

1. That it is almost universal in exophthalmic goître.

2. That it exactly resembles the tremor produced in animals after removal of the thyroid: it is in fact a thyroid tremor.

3. That its character is much more uniform than that of hysterical tremor, for which it might otherwise be taken.

I cannot discuss here the diagnostic differences between this tremor and that due to alcoholism, paralysis agitans, disseminated sclerosis, and various metallic poisonings, but here are some tracings illustrating these distinctions.

Dr. Judson Bury informs me that he has once found marked fibrillation of the interosseus muscles of the hand, in addition to the ordinary tremor, but this he was inclined to ascribe to a peripheral neuritis.

My allusion to a pseudo-epileptic state brings up the question of *eclamptic convulsions*. To this M. Ballet† devoted attention in 1883. He collected many cases, and showed that though the main cardiac signs may supervene in chronic epileptics, in another series of patients the convulsions had a direct relation to the increased heart action and were, perhaps, induced by it.

Clonic spasms of one side of the face, convulsive tic, is described in one instance by Eulenburg, and in another by Dr. Hughlings Jackson, who attributed the convulsion to discharge of facial centres in the pores. Similar spasms have been seen affecting the muscles of one shoulder and the side of the neck.

Chorea‡ is undoubtedly a frequent concomitant, but I dismiss it as probably purely secondary to vasomotor disturbance.

* 'Brain,' LIX and LX, p. 424.

† 'Rev. de Médecine,' 1883, p. 254; Kovalivski: 'Arch. de Neurologie,' xviii, p. 422; 'St. Barth. Hosp. Rep.', 1874, p. 254; R. Reynolds: 'Lancet,' 1890, i, p. 1057.

‡ L. Gros: 'Soc. Méd. de la Seine,' August 19, 1864; Gagnon: 'Gay. Hrbd. de Méd. et de Chir.', 1876; Kelly: 'Med. Press and Circular,' 1878; Ghoyinski, 1880; Jacobi: 'Med. Reæ,' New York, 1879; Patel Gros; 'Thèse de Paris,' 1884; S. West: 'Trans. Ophth. Soc.', 1886; Guéneau de Mussy:

A form of clonic spasm, as yet undescribed in Graves's disease, is worth noting; it occurred in a patient of mine last year, the Mrs. W. K. mentioned above. She had only been married three months, and got wet and fatigued on the eve of a menstrual period. She was seized suddenly with regular rhythmical convulsions, beginning in the flexors and extensors of the hands, and spreading to the neck and arms. Consciousness was quite unaffected, and she had not the least hysterical manner, and was rather amused than frightened at her condition. The convulsions lasted nearly all night. Next day the form had rather changed, the commonest movements were a perfectly regular jerking forwards of the shoulders, effected by the pectorals, at intervals of about three seconds. After a few minutes this would change, and violent tremor begin in the right arm; at first a rapid pronation movement exactly resembling paralysis agitans, and altering to pure flexion and extension movements. The movements were not induced by attempting voluntary action, and were not modified by it, but they were distinctly increased by watching her, or by any sudden disturbance.

Temperature was normal, but the pulse was continually raised 120—130.

There was no impairment of sight, and the field of vision I took and found good.

I thought there was distinct anæsthesia of the legs. These convulsions recovered at increasing intervals for many weeks, but gradually subsided. They varied much in character, but the usual type was a violent shrugging of the shoulders. Another form resembled the action of polishing something lying on her knees.

This form of convulsions is not uncommon in so called hysterical subjects, though the jerking of the pectorals is rare. The flexion movements of the hands were, however, only an exaggeration in degree of the tremor usual in Graves's disease.*

The vague class of symptoms known as hysteria goes hand in hand with Graves's disease, and pure hysterics may develop the

'Soc. Therap.', November, 1881; 'Acad. de Med.', January, 1882; 'Rev. de Méd.', May, 1890. Three cases are given by Marie: 'Arch. de Neurologie,' 1883, p. 84.

* 'Berl. Klin. Woch,' July 3, 1893. Gowers: 'Diseases of Nervous System,' II, p. 921. v. Maude: 'Brain,' LIX, 1892, p. 424.

cardiovascular condition. M. Charcot used to say that as the cardiac signs increase, so the purely hysterical signs diminish, but I confess I have failed to corroborate this remark.

Leaving untouched the vasocardiac disturbance, there are other bulbar symptoms less widely known.

A slight difficulty in swallowing, not due to any pressure on the trachea, is common enough; it resembles that seen in myxœdema.

The patient, whose other paralyses I shall pass on to, presented on the subsidence of those paralyses a slow drawling speech, like that in insular sclerosis; this disappeared after some weeks, and was succeeded by a marked stammer to which she had not been subject before.*

Stammer, of an ordinary type, is however frequent; some persons, according to Dr. Russell Reynolds, have great difficulty in getting out certain words, or even any words at all. I have seen *three* women who at times had this inability: it was not due, however, to incoordination, and I thought was not an *aphasia*, but a pure *amnesia*.

The *facial nerve* is rarely paralysed completely, but a few instances are recorded, one by myself. But almost all cases show some enfeeblement of the upper division of the facial, with lowered electrical irritability.

I have myself no hesitation in saying that both the eyelid symptoms, Graefe's and Stellwag's signs, are due to paresis of the temporal division of the temporofacial nerve.

Of instances of complete external ophthalmoplegia there are already quite a series, beginning with Dr. Bristowe's classical case, and ending with the example I published last year, the same patient who had facial palsy. I must note that she had catarrh of the external ear. But the lesion was probably central, notwithstanding, as she had consecutive paralysis of the facial, the 6th, the 4th, and, finally, the 3rd nerve, though the last was never completely paralysed.

Isolated paralysis of all the ocular muscles does, though rarely, occur; but paresis of the internal and external recti is comparatively common, though I do not think they have been sufficiently studied in connection with the existence of errors of refraction.

* S. West: 'Ophthalm. Soc. Trans.', 1886.

Intense general muscular feebleness is, so to speak, proper to Graves's disease; a general weak muscular action with readily induced fatigue, a condition similar to that in neurasthenia. But this weakness is usually much more marked in the legs, and we find that tendency to give way at the knees in walking, which the French call *dérobement*, noticeable also in myxœdema and in locomotor ataxy; a similarity to which M. Charcot has drawn frequent attention in his Tuesday lectures.

This paresis of the legs may be so extreme as to constitute a veritable paraplegia, and this paraplegia I have from my own observation separated into two groups.

1. That in which the paralysis is merely an accentuation of the previously existing general paresis, produced by the stress of an acerbation of other symptoms, such as diarrhœa, sickness, or cardiac dilatation and failure: this form is, I think, peripheral.

2. Those cases in which the paralysis comes on suddenly and resembles other so-called hysterical or functional forms of paraplegia, such examples are usually transitory, and like other transitory functional paralyses they *never* produce contractions. No instance of diminished muscular sensibility, with the exception of coincident cases of locomotor ataxy, can I find, and in no case has the rectum or bladder been affected in their functions.

The patellar reflexes are usually diminished and often absent; this fact, first noted, I think, by Marie, I have confirmed in many instances.

Muscular wasting is only pronounced when the paresis has been prolonged, but it has been found, in the case of isolated monoplegia, to be quite out of proportion to the degree of paralysis.

In all these cases of paralysis the observers at the Salpêtrière have found both galvanic and Faradic reactions lowered.

Bed sores are unknown except, as far as my reading goes, in the one instance, our President's patient, Marion.

All this evidence serves to throw this second form of paraplegia into the category of functional paralyses of the flaccid type, that is with no contractures, and spinal in origin. Dr. Cheadle has described the only example of contracture following on such a paralysis, which affected the right arm.

Hemiplegia is known, but is rare. Omitting several cases where the lesion was clearly organic and focal, I can find records of but four, in three of which there was accompanying hæmi-

anæsthenia, and in two of them various ocular paralyses. One of those cases is, of course, Dr. Bristowe's.

Monoplegias of divers groups of muscles of the limbs are recorded. The only instance I have seen was of complete monoplegia of the whole of one arm, lasting for about three days, following the subcutaneous injection of digitalin in that arm.

Among functional alterations in the spinal cord a common one is *astasia-abasia;* that condition which has not long been differentiated, in which, with no intrinsic motor paresis, the patient is yet unable to stand or walk, though the legs can be moved briskly when lying down. I have proved its existence in several cases, since Eulenburg first drew attention to it in this disorder. But it cannot be claimed to have any special significance, as it occurs in neurotic subjects in the debility following various acute diseases.

Various *organic nervous diseases* have been found accompanying or preceding Graves's disease. They are rare, and I will merely enumerate them: general paralysis, progressive muscular atrophy, syringomyelia, and locomotor ataxia. The last is comparatively common, and has attracted great attention in France. There is no question that isolated symptoms suggesting exophthalmic goître, such as permanently rapid pulse, palpitation, and slight exophthalmos may occur in locomotor. Moreover, signs of well-marked Graves's disease have supervened in the course of tabes dorsalis, and the question has been raised whether this is not due to an invasion of the medulla by the sclerosis; but as yet there has been no verification *post mortem.*

Focal lesions of the brain from hæmorrhage or embolism may occur in the subjects of our neurosis, but there is no evidence that they are more frequent than in other people.

Lastly, let me accentuate particularly a group of symptoms all of great frequency, which, when unravelled from others, seem to me to point to *peripheral neuritis.*

Unfortunately the evidence is purely clinical as yet; no neuritis has ever been discovered *post mortem*, but, as far as I can find, no attempt has been made to look for it.

These symptoms are—

1st. Cramp, which has often been observed. Dr. Hector Mackenzie* has shown how common it is, and I can verify the

* 'Lancet,' *loc. cit.*

observation. This cramp may constitute tetany of the ordinary form. Dr. Mackenzie saw several cases, and I have seen one. These painful muscular contractions occur of course in persons with considerable intestinal and gastric disturbance, because such disturbance is very frequent in Graves's disease. They may properly be regarded as due to some toxin developed in the intestinal canal as ordinary tetany is caused.* At the same time we must remember how frequently tetany results from extirpation of the thyroid.

2ndly. General hyperæsthesia is so usual in this disease that quite lately Professor Grainger Stewart† has pronounced that it is the rule rather than the exception. Partial anæsthesia is less common. But varying degrees of numbness, tingling, and pain in the legs, the subjective side of anæsthesia and hyperæsthesia, are common causes of complaint.

3rdly. The symmetrical paresis of the legs which I have described, and the lowered or abolished patellar reflexes.

Surely we have here the symptoms of peripheral neuritis in an early stage; but it seems not to become marked. Conditions indicating complete neuritis are unknown. Struck by this I examined these cases carefully for glycosuria, because slight peripheral neuritis is so common in diabetes, while marked neuritis is unknown; moreover, glycosuria is so often associated with Graves's disease. But I never found sugar present once.

On the other hand, the coincidence of gastro-intestinal crises was so frequent that it is reasonable to attribute these neurotic phenomena to intestinal auto-intoxication.

I would suggest also that those forms of localised œdema, evidently of neuropathic origin, which are now well known in Graves's disease,‡ are manifestations of peripheral neuritis. They are comparable, perhaps, to the cases which our President described last year at Nottingham§ as hysterical neuritis, in which œdema was occasionally a prominent feature.

* Ross and Bury: 'Periph. Neuritis,' p. 403.

† 'Edinb. Hospital Reports,' vol. i.

‡ Maude: 'Practitionem,' December, 1891.

§ Bristowe, 'Brit. Med. Jour.', II, p. 1099, 1892.

I have never seen an instance of beri-beri, but the descriptions of the œdematous form of that disorder seem to bear a strong resemblance to the combination of paralysis and œdema which I describe in Graves's disease; and the pathological condition in beri-beri is known to be a peripheral neuritis.*

This is a very imperfect sketch of a large range of nervous disturbances which affect every area and every level of the nervous system. I find great difficulty in ascribing any of the symptoms I have indicated to variations of blood supply, and we cannot fail, I think, to be struck by the resemblance of the clinical picture to the results of poisoning by alcohol, lead, and, perhaps, beri-beri.

Pathologists have long sought to explain the phenomena of this disease by some focal lesion in the sympathetic or the medulla. But as our clinical knowledge grows, the more unsatisfying such explanations become.

The old sympathetic theory died hard, killed by Filehne and Dr. Hale White, but will any lesion in the medulla do more than explain the cardiovascular symptoms? I think not.

We must regard the neurosis as a nerve poisoning, for the present; the brunt undoubtedly falls on the medulla, but it is felt from the cortex to the periphery. What that poison is we do not know. That there are probably secondary poisons I have indicated. But remember the one feature, so peculiar to the disease, the thyroid change.

To my mind the universal goître, the connection with myxœdema the results of operations on the thyroid, point to that gland as the fountain-head of evil.

This is only a provisional speculation as yet, but, failing surer ground, we must have provisional theories to direct our minds at the bedside.

Dr. de Havilland Hall (Vice-President, in the Chair) spoke of the association of Graves's disease with intra-nasal disease, and referred to the discussion that took place some years ago at the Clinical Society on a case brought forward by Dr. Semon, in which, as a consequence of the removal of nasal polypi by the galvano cautery, the patient got unilateral enlargement of the thyroid with some proptosis. His asthma was cured by the operation, but in its place he suffered from another neurosis, *i.e.*, Graves's disease.† Other cases of this kind had been recorded, as well as cases in which Graves's disease had been cured by intra-nasal treatment.

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* Ross and Bury: 'Peripheral Neuritis,' 1893, p. 316.

† On reference to Dr. Semon's paper ('Clin. Soc. Trans.', vol. xxii), it will

He pointed out that if the sympathetic origin of Graves's disease had indeed received its death blow, as suggested by the author, it would be difficult to explain how a disease like Graves's could be cured by intra-nasal treatment.

Dr. PASTEUR, referring to the possible influence of altitudes, observed that according to information which he had obtained from a very reliable source, though goître was common in Switzerland and in high altitudes, yet exophthalmic goître was a comparatively rare disease. The general view among the medical men in Switzerland was that altitudes had nothing whatever to do with it.

Dr. BOWLES said that, like the author, he had had many opportunities of observing patients over long periods of time. In reference to the alleged association between myxœdema and Graves's disease, he said he had seen two cases, one of which was under his personal observation. After suffering for several years from the symptoms of Graves's disease, this patient ultimately developed myxœdema. In a discussion at the Medical and Chirurgical Society a few years ago, Dr. Semon stated that Professor Kocher had alleged that the removal of the thyroid gland produced myxœdema. At that time he (Dr. Bowles) believed that this result was improbable, on the ground that Professor Kocher was dealing with patients already diseased, and that the subsequent symptoms were possibly only a prolongation of the original disease. Having gone to Berne to see Professor Kocher's practice, he now admitted that Professor Kocher was probably correct. Professor Kocher had pointed out that if a small portion of healthy gland was left, the symptoms of myxœdema did not occur; but that if the gland was removed, then myxœdema supervened. Kocher had an unique experience, having performed 480 operations. One patient was kept seven or eight years under observation. Early in his experience Kocher tried to prevent myxœdema by grafting portions of thyroid gland into the body of the patient, but always without success.

Dr. BURNEY YEO referred to two cases which he had brought before the Clinical Society some years ago to show the neurotic character of the disease. One of them presented an unusual evolution of the symptoms. The exophthalmos was on the right side, the chief enlargement of the thyroid was on the left; on the side of the exophthalmos the eyebrows and lashes were shed. The patient subsequently had enlargement of the thyroid on the left side, and then exophthalmos on the opposite side, and the eyebrows and lashes on that side were also shed. Before the Clinical Society he had urged much the same argument as that advanced by the author, viz., that they paid too much attention to the striking local phenomena, and overlooked the symptoms pointing to an affection of the general nervous system. He asked whether the author had observed any crossed phenomena similar to those he had described.

Dr. SAVAGE ranged himself among those who hold that exophthalmic goître does not commonly occur in association with ordinary goître. Some years since he had collected the histories of upwards of 1,000 cases occurring in a certain district in Cumberland, and he had not met with a single case of Graves's disease among the number. He could not accept on purely theoretical considerations the idea that it was due to peripheral neuritis.

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be seen that there was unilateral exophthalmos, but no enlargement of the thyroid gland.

Peripheral neuritis occurred under so many different circumstances and in many diseased states as part of the disease, and not as the cause. One might as well say that peripheral neuritis caused general paralysis of the insane, because it was often met with in that affection. It was interesting to note that there was a type of recurrent mania associated with enlargement of the thyroid, prominent eyes, and increased heart beat, which was relieved by the remedies that gave relief in Graves's disease. He referred to cases of general paralysis of the insane, in which the onset was marked by exophthalmic goître. He had seen at least a dozen examples of this association of symptoms. In some of these the exophthalmos was much more marked on one side than on the other, but he had not noticed the cross relationship between the thyroid enlargement and the proptosis referred to by the author and the previous speaker.

Dr. HERON said that the thyroid was always more or less enlarged in cases of Graves's disease, and he had also been struck by the oddness of temper in persons afflicted with this affection. The patients were subject to one of two forms of bad temper : in one form it was an almost insane fury, and the other a sort of sullen savagery. He referred to the case of a young woman, not the offspring of insane parents, though her grandmother was said to have committed suicide and had certainly been a drunkard. Long before this patient developed Graves's disease she became subject to extraordinary fits of temper on slight pretexts. Her parents consulted several medical men as to whether the attacks were not indicative of insanity. At the age of 40 she developed exophthalmic goître. He raised the question whether persons who exhibited this peculiar condition of temper ought to be considered responsible should they in one of the attacks lapse into crime. Further, it was incumbent on medical men to impress on the patient's friends the fact that the ebullitions of temper were not to be measured by the same standard that would apply to ordinary persons.

Dr. G. MURRAY, of Newcastle, maintained that there was very strong evidence that the thyroid was a secretory gland. In support of this he instanced the experiment on a monkey, in which the symptoms of cachexia strumipriva were induced by the total ablation of the thyroid gland, and then removed by the injection of thyroid juice. If the gland underwent enlargement in Graves's disease, the symptoms might be referable to a hyper-secretion of its special fluid, though he would not assert that all the symptoms could be thus explained. If such were the case, they might anticipate that measures directed to the diminution of the size and activity of the gland would be beneficial. Inunction of the red iodide of mercury ointment, by reducing the size of the gland, tended to benefit patients, as did also belladonna. The latter restricted glandular secretion, just as in myxœdema pilocarpine afforded relief, because it probably called into activity shreds of gland which did not function under ordinary circumstances. It was noteworthy that in myxœdematous patients too large doses of thyroid extract caused an acceleration of the pulse, 110 or 120. He knew one patient in whom five minims of the extract ran the pulse up to 120 per minute. Only the other day a patient, the first on whom he had tried the effect of the administration of the thyroid extract, came to him complaining of hot flushes and palpitations. Her pulse was 110 to the minute, the skin was moist and perspiring, and she presented a tremor of the hands such as one observed in exophthalmic goître. Not long since Dr. Saundby, of Birmingham, had shown a similar case, which he said resembled a case of Graves's disease, though Dr.

Saundby had not stated in what this resemblance consisted. If the dose of thyroid extract were pushed, the symptoms referred to, and also muscular weakness and even wasting, indeed all symptoms of Graves's disease, supervened. In comparing Graves's disease with myxœdema it was striking how opposite they were. In one, the thyroid was contracted, there was a pale rough skin, the electrical resistance of which was increased, slowing of the cerebral functions, and general apathy; while in the other the gland was enlarged, the skin moist, and the temper excitable. A case had occurred in which both sets of symptoms appeared to be present, but it was doubtful whether it was in reality a case of myxœdema. The administration of thyroid extract was without effect.

Mr. Jas. Berry showed microscopical specimens of ordinary goître, together with others from typical cases of exophthalmic goître. He pointed out that while in the latter there was complete absence of colloid secretion, the vesicles being ill marked and filled with small round cells, in the specimens from early forms of parenchymatous goître there was a large increase in the secretion of colloid. The naked eye appearances were almost as characteristic. The goître of Graves's disease was usually far more homogeneous than was the case in the ordinary form. Unfortunately the museums of the London hospitals were not rich in specimens of the thyroid gland of exophthalmic goître.

Dr. Ord did not think that exophthalmic goître was more common than formerly, the apparent increase being probably due to better knowledge. He thought that if they watched their cases of cardiac disorders they would become more and more aware of changes in the thyroid. He was inclined to agree with what the author had suggested as to the connection between exophthalmic goître and myxœdema. He had seen a large number of cases in which the symptoms of myxœdema had followed those of exophthalmic goître. It seemed to him that the process at work was an active increase of the vascularity of the thyroid and a proliferation of its secreting structure. This ultimately led to atrophy or destruction. Once or twice he had found that measures directed to the reduction of the size of the gland had been followed by a very rapid reduction and by subsequent symptoms of myxœdema. The relation between the two processes had been brought before him in some cases of the diseases occurring in collateral relations, in more than one member of the same family, one sister having enlargement of the thyroid, another symptoms of myxœdema, while a third would have symptoms of Graves's disease.

Dr. Guthrie thought that the condition of the thyroid in the early stages of Graves's disease was one of increased vascularity. Later on there might be degeneration and symptoms of myxœdema grafted upon Graves's disease. He pointed out that the size of the thyroid varied considerably from time to time, and he had certainly seen cases in which the enlargement was very temporary. He referred to the case of a newly married lady, whose thyroid enlarged and pulsated owing to nervousness or embarrassment. This person had a sallow, almost muddy, complexion, with marked bronzing of the face and neck. The author said that the sympathetic theory was dead and buried, but he apparently reposed on Dr. Hale White's observation of the presence of hæmorrhages on the floor of the fourth ventricle, and the doubtful discovery of Filenne that section of the restiform tracts determined the characteristic symptoms in animals. Dr. Guthrie also called attention to certain abdominal symptoms in Graves's disease to which the author had not referred, and

in particular to pulsating aorta. This was known long before Graves's disease was recognised, and the great Harvey had mistaken such a case for one of aneurism. With pulsating aorta, epigastric pain, gurgling, phantom tumours, and gastro-intestinal disturbances, vomiting, anorexia, hematemesis, boulimia, &c., were present. There might be fluxes from the bowels, melaena, and, in females, menorrhagia, also discoloration of the skin in Graves's disease almost as marked as in Addison's disease. The irritable and utterly miserable mental condition was noteworthy. Sometimes the legs swelled, and there were weakness and general tremors. This collection of symptoms was usually found in Graves's disease, and he was disposed to regard pulsating aorta with its attendant symptoms as the abdominal form of Graves's disease.

Dr. Hector Mackenzie said he had observed cases of this kind for many years, and the longer studied the more apparent was the necessity for watching them for long periods of time. He said he was open to conviction, but he was not yet persuaded that the disease was due to thyroidal changes. The records of the results of operation were far from trustworthy, many of the cases reported as Graves's disease being in all probability cases of ordinary goître. Opinions differed considerably as to the connection between ordinary goître and Graves's disease. His own experience supported the view that the subjects of goître were not specially liable to Graves's disease. He referred to a paper by Dr. Bruce Low, who had only met with five cases of the latter out of 260 cases of goître. It was useless, however, to rely upon individual observations, and the matter could only be cleared up by collective investigation. If, as alleged, there was such a close causal connection between the altered thyroid gland and Graves's disease, one would expect to produce serious effects from the administration of thyroid extract in the malady. He had treated one or two cases of Graves's disease by the administration of large doses of thyroid extract without any good or bad results, showing that at any rate over-secretion of the thyroid gland could not be responsible for every symptom. This was an important point, because, if they concluded that the basis of the disease was thyroidal change, they might listen too readily to suggestions for surgical intervention. He himself thought that the disease tended to subside spontaneously in the majority of instances, and nearly all the cases under his own observation had gradually improved, although the treatment adopted had varied considerably.

Mr. Maude, in reply, said that the question as to the possible *rôle* of nasal trouble was very difficult to answer. Possibly the cases alluded to were not true cases of Graves's disease at all, or, if so, due to secondary implication of the thyroid. He pointed out that he himself had not attached any importance to the influence of altitudes. There was no doubt that myxœdema might ensue after thyroidectomy. What he had stated was that this had never occurred in thyroidectomy for Graves's disease, but in only 11 cases was the thyroidectomy complete. He had never observed the crossing of the symptoms mentioned by Dr. Yeo. He had not alleged that Graves's disease was due to peripheral neuritis ; on the contrary, he had pointed out that the neuritic symptoms were probably secondary to intestinal intoxication. The question of responsibility for crime would be that of all affections leading to acute mania. He referred to the comfort afforded by cold in the form of Leiter's coil. In one case he had noticed that the thyroid became very hard, giving a sensation on palpation which he had never met with in health, but in the same patient the gland was sometimes quite imperceptible. In respect of Mr. Jas.

Berry's specimens, he pointed out that it was impossible to argue too rigidly about the condition of a secretion and the appearances of the gland under the microscope, especially as they were ignorant of what the secretion was and how it was secreted. The theory of the involvement of the sympathetic was dead and buried, because the lesions discovered by Dr. Hale White and others had been shown to be common to all sorts of conditions, and might be met with even in health. He had never noticed the presence of a pulsating aorta, but he had seen pulsating veins, which he supposed belonged to the same category. He admitted the force of Dr. Murray's remarks, and said they must get a large number of series of operations before they could draw any reliable conclusions therefrom.

October 30th, 1893.

SOME NEUROSES OF THE CLIMACTERIC AND SUMMARY OF CLIMACTERIC CASES AT BETHLEM, FROM JULY 1, 1888, TO JUNE 30, 1893.

By George H. Savage, M.D., F.R.C.P.

The subject of the climacteric is one which, though commanding the attention of those practising in the general and special fields of medicine, seems for some strange reason to have been overlooked, for on turning to a recently published book on gynæcology, I find this statement: "Take ten or a dozen of the most recent books on gynæcology, and in most of them the word menopause is not to be found in the index." When I went to the Royal College of Surgeons Library, I found not a single entry under either of the heads Climacteric, Change of Life, or Menopause. There were certainly two books on the subject, one in English, by Dr. Tilt, and one in French, by Dr. Gardann; the book by Dr. Tilt being altogether an excellent one, though perhaps, according to our modern notions, rather too full of vaso-motor explanation of symptoms. I shall, without apology, then, at once proceed to lay down the lines which I intend following. First of all, I shall not, in any detail at least, consider the question as to whether a similar state, such as is called "*change of life*," occurs in both sexes. It seems to me that undoubtedly any serious

physiological change is likely to be associated with temporary disorder of function, and, as the physiological change is greater in women than in men, so the associated functional disorder will be more in the one sex than in the other. Besides the striking cessation of a bodily function which has been in work for many years, there are correlated changes which may occur in the feelings which are due to change on the physical side. Similar changes of feelings are to be met with in men, and I frequently meet with parallel states occurring in women at the menopause, and in men who have retired from active work.

Next, I will give the general results of my experience as to the frequency with which true neuroses depend on the menopause. I shall make use of some tables kindly prepared for me by Dr. Craig, at present clinical assistant at Bethlem Royal Hospital, for permission to use which I am indebted to my friend and former colleague Dr. Percy Smith. I shall consider the exaggerations of the ordinary symptoms of the menopause which in some cases pass over the limit of sanity. I shall discuss a few of the more interesting types of disorder which are special, or almost special, to this period.

As a first proposition, I would say that any normal symptom, bodily or mental, which may occur with the menopause, may be so exaggerated as to become morbid. I shall not refer to all such exaggerations which I have met; it will suffice to point out some, and I expect my hearers can supply many others. Feelings of fulness in the head and of flushings of heat and sensations as of cold following the flushings are common, and I often come across patients who think that something has burst in their heads, and that, as a result, they are permanently incapacitated from work or pleasure; while others think that their skins are in some way affected by external influences, such as drugs and the like.

To refer in more detail to the former cases. In my experience there are special head symptoms, or head feelings, which are commonly associated with disorders of the reproductive functions; thus in hysteria we meet with complaints of "clavus," and with this disorder, pain is referred to the occipital region. The same is true in the climacteric period; complaints of fulness at the top of the head are common, and in these cases, as in the younger ones, I often hear of a feeling as if something had suddenly given way in the head. This idea that something has really broken

must have some definite cause, but I have failed to discover it; I hear of something having given way about the uterus, and I have heard it described as truly hysterical; so that it seemed to arise from a separation of the womb which rose to the throat. The feeling of giving way, in a certain number of cases, is associated with an almost instantaneous change of the feelings of the patient, who from that time feels dead and unlike her old self, and may believe herself to be unlike anyone who ever existed before. In some cases the feeling is described as if a flood of hot blood had passed over the surface of the brain, and in some there is a feeling of complete or partial loss of brain as a mass. In some the feeling is described as one of deadness or of emptiness; but, whatever the description given, I have no doubt the physical cause, whatever it is, is the same, and I repeat, such feelings are common in association with disorder of the reproductive organs, whether at their onset or their cessation.

All of us must recognise the frequency with which complaints are made of uneasy sensations in the skin in patients at the climacteric. These uneasy skin feelings are variously and often insanely interpreted, and these explanations may lead to various false accusations. I have known one woman accuse another woman of throwing chloride of lime over her, while a second patient said that it was chloroform which was used; the uneasy feelings may give rise to ideas of filth, or of the presence of some skin disease; thus I have met with climacterics who thought they had the itch, small-pox, or syphilis. Again, I have not uncommonly met with such women, more particularly single women, who accused persons of either taking indecent liberties with them, or trying to get possession of, or influence over, them in some way. Medico-legally, such cases are of great importance.

The morbid feeling of dirtiness acts in several ways, in some cases leading to constant washing or rubbing, and in some to accusations against others of causing the dirt. The constant washing met with in some insane patients generally has a sexual origin, though in chronic cases it may have passed into a habit whose origin it is hard to trace. I saw recently a lady whose only worry was about cleansing her hands after passing water, and, as a result, she would only touch a chamber vessel with gloved hands. In other cases there is a distinct dread either lest she should contaminate others or be herself infected or rendered dirty by touch-

ing such things as door-handles and the like. The varieties of interpretation of this insane feeling are endless.

While speaking of changed skin relations, I must refer to the development of hair on the faces of women; this, of course, may occur at any age, though it is probably more common at or after the menopause. I believe this is much more common in the women who come of nervous or degenerate stocks. It may occur, though by no means as a necessity, after the removal of the ovaries. Its effect is very marked on the character and temper of many women, some, from the time they recognise it, shunning society and dwelling on their misery. Such women may become very suicidal, as in a woman in Bethlem Hospital, who in a letter, which was written with the idea that before we got it she would be beyond our reach, wrote: "It is all on account of these vile hairs." It is simply this, that in many persons, more particularly those belonging to nervous stock, any natural feeling may develop into morbid self-consciousness, which may make the individual a kind of world-centre of misery.

With the flushings and uneasy head feelings there may be giddiness, faintness, or fits of some sort, which have been attributed to that unknown factor "congestion." In some patients epileptic attacks either come on at the menopause, or they become worse at this period. There is nothing in my experience which separates the epilepsy of the climacteric from that which may occur in either sex after the turn of life. But it is well to recollect that this may be associated with temporary lapses of consciousness and automatism during which the patient may commit acts for which she is not responsible.

So-called "nervous irritability" is common at this period, and, just as it is common to meet with married people who seem to first enter into a higher union after their silver wedding, so it is not uncommon to find the calm preceded by a storm which may wreck the happiness of a life. With the passing of the sexual function there is a strange feeling of changed relationship which may in one set of women lead to querulousness and exaction, while in another it will lead to jealousy. Women when suffering from ordinary amenorrhœa often, in my experience, have insane ideas related to this; thus one will feel sure that she is no longer like other women, and that, therefore, she is no longer attractive to her husband; another believes this to a certain extent, but feels more, as

if she were out of step and could not catch up her duties, and, as a result, begins a system of worrying which destroys all domestic peace. It cannot be too early recognised as a malady of the menopause, and treated by as much consideration and change and variety from home as possible; this nervous dread may be concentrated on others rather than on herself, and in such cases the mother is afraid to lose sight of her children, or may be in torture while her husband is away. She may believe that some evil has come to the latter, or that he has left her altogether for another. She may blame herself for having driven him away by her bad temper or mismanagement.

As to fully-developed insanity, all observers agree that melancholia is more commonly met with than mania; I would rather put it thus, that in all forms of mental disorder associated with the climacteric, there is a tendency rather to depression and self-consciousness than to loss of control and violence. It will be seen from my 54 Bethlem cases, 32 were melancholic, 10 were maniacal, 7 suffered from delusional insanity, 3 from mental weakness, and 2 were general paralytics. It is probable that nearly all those suffering from delusional insanity had delusions of suspicion, and were solitary and unhappy. With the change of life there is almost necessarily a return to a state of self-conscious weakness; in healthy middle age we should be unconscious of the performance of our organic functions, but with age there comes a re-assertion—if one may use the term—of the independence of these organs, and in many cases the self-consciousness readily becomes developed into melancholia. In man, as a rule, there is a greater tendency, with the decline of life, to hypochondriacal feeling or to dread of poverty, whereas with women the tendency is rather to dread, derived from the sympathetic side, dread of loss of affection, or fear of being no longer useful or attractive to others. Man seems to have his self-feeling built up along the nutritional line, built up from the stomach, if you like, while women are more built up on the reproductive line; the old idea that a man's mouth should be stopped with food, while a woman's should be with a kiss being, in my experience, a true philosophy.

Mania is very generally a result of weakness, being the result of loss of higher control; but here we shall meet with a complication which must not be forgotten. Alcoholic excess may be, and often is, a symptom of the climacteric, and alcohol gives rise to mania

more frequently than it does to melancholia, hence a certain proportion of our maniacal cases owe their origin to drink.

Delusional insanity holds a very prominent place among the forms of insanity which occur at the climacteric period, and in such cases alcohol often plays an important place, for I am sure that alcoholic poisoning, both from its effect on the higher centres and also by the production of peripheral neuritis, may lead to confusion of ideas and delusions. The neuritis gives rise to impaired sensory perception which causes confusion, just as deafness may lead persons to suspect their surroundings, so imperfect taste, smell, or feeling may give origin to false notions about the environment.

Deafness of the Menopause.—I find that Tilt refers to deafness as occurring with the change of life, but he does not go fully into the various relationships which this bears to the nervous state. In some cases, according to him, there arises temporary deafness, which may pass off, and he also refers to more permanent deafness which may then arise. I have for many years noticed that at the menopause a form of deafness may come on, which rarely passes off, and which has a very marked influence on the mind. Deaf persons tend to be suspicious that those about them are speaking about them, and to become querulous and irritable. These mental symptoms may be but the result of the deafness which is recognised as a factor in some forms of insanity, with delusions of suspicion; but beyond this, I believe, there is a distinct group of cases in which the deafness and the suspicion arise at the same time, and together join in the building up a form of neurosis which is pretty constant in its aspect, and very unfavourable in its result.

I have met with many women about the climacteric who begin with slight deafness, which increases steadily and slowly. At the same time there is complaint of head fulness, of flushings, and of sleeplessness, the appetite is uncertain, the bowels confined, the memory is often said to be defective, but I believe this is due to lack of attention; later there are often disagreeable tastes and smells, and with these are associated ideas of poisoning, drugging, and the like; in some cases there is a feeling of "brain want," and in these there is often suspicion that the profound, unconscious sleep they have is not natural, but is the result of drugging. Cases of this kind very frequently steadily develop into typical ones of the "delirium of persecution"; some become solitary, and avoid all society, while others develop ideas of grandeur. Both

are very unfavourable, and though I have seen one or two such cases improve I believe they are eminently unsatisfactory. The deafness whatever its cause always standing in the way of recovery, for it hinders the reception of impressions which might correct the false notions.

I have been in the habit of contrasting these cases with those of general paralysis of the insane: in these latter we have a progressive nervous degeneration which affects the motor system first and principally, whereas in the former cases we have a group of cases of progressive nervous disease in which the sensory system suffers first and chiefly.

I have for years been in the habit of teaching that hallucinations of smell are much more common than is generally believed, and that among the hysterical and the climacteric they are specially so. I now go a step further, and say that, with disorder of the reproductive organs, I frequently meet with hallucinations of smell. That this is a true connection seemed established by a patient I had in Bethlem, who had marked hallucinations of this sense, as well as ovarian disease; on the removal of the disease the hallucinations passed off entirely, though the patient did not lose her other mental disorder.

If this is a true connection, one has a right to suggest a reason; and I would put it that, though now in men the sense of amatory attraction is usually and chiefly in sight, yet in the lower animals smell plays a very conspicuous part in the development of passion, and the use of scent by certain persons seems to bear a relation to this subject.

The connection between moral defects and the menopause is worthy of our consideration. We probably meet most commonly with a tendency to excess in stimulants; this is in many cases only a development of what has been under control before, or what has hitherto been done on the sly; but in others there is a feeling of restless unsatisfied desire which is lulled for a time by the use of alcohol. Such patients are like the rest of female drinkers, untruthful in an extreme degree, and they are likely to be dishonest as well as shameless. Unfortunately the habit, whether developed or increased only at the menopause, is not likely to pass off with the establishment of the new balance.

A very interesting class of cases is that in which, with the cessation of the menstrual function, there is a perversion of the

sexual or sympathetic side of the woman, and I shall have to consider this from two sides: first those in whom there is a sense of defect, and with it a feeling as of loss of affection and interest; whereas on the other hand the function before its final extinction bursts from all control, and appears as insatiable lust. In the former cases one meets with every shade or grade, so that one lady who had been able to aid her husband greatly by her social ability in his political life, with the change of life came what might be called loss of power of accommodation, so that she who had displayed infinite tact in managing a difficult political party, caused irritation where before she had been a power tending to peace. This inability to fit herself into changing surroundings at first was not evident to herself, and when later she did perceive her inability to do what formerly she did, she very naturally, though falsely, accused the surroundings, preferring to think that she was steady while the earth reeled. Taking one step further, we meet with the exacting women who are almost as troublesome when single as when married, such, if single, are wrapped up in one friend whom they pester with their demonstrations of affection, and who are intensely, even dangerously, jealous of the approach of anyone to their idol; I have met with women suffering in this way at other periods than at the climacteric, and I have known one at least lose the insane jealousy when the menopause had passed.

Though this affection may be very trying when the patient is single, and I would say here the insane affection rarely centres on any member of the patient's own family; it is much more trying, and not nearly so well borne, when the patient happens to be married. Many a happy married life is ruined at this period. The wife seems to lose all sexual feeling, but at the same time suspects that the husband has not suffered in this way; she therefore suspects that he shuns and avoids her, to seek satisfaction elsewhere. There is not always the same sexual element in the disorder, for in some cases there seems to be a dread lest the husband should suffer some evil while away from home. Thus I have known a wife miserable as long as the husband was from home, and even when at home was never satisfied unless he was in her presence; this over demonstration of affection is intolerable, and leads in many cases to the husband really staying away from home longer than is necessary, and thus giving the morbid feeling something

real to feed upon. If once the feeling of loss of affection arise, trifles light as air are sufficient to confirm the notion. I have recorded, in the Guy's Hospital Reports for 1889, a series of cases in which this insane jealousy arose under these conditions, as a rule of the climacteric, and time alone prevents me giving similar cases here.

As I have said, there is, before the extinction of the function, in some cases a distinct revival, there is a tendency to hysterical disorders of various kinds, so that I have met with a renewal of hysterical fits which have not been met with since the adolescent period. I have often had complaints of globus hystericus, distress due to borborygmi and clavus, depraved appetite, such as coal-eating, chalk-eating, refusal of food, and similar hysterical vagaries. With evolution one passes through a period of nervous instability, and with commencing dissolution one may do the same, the passage from full maturity to second childhood may display a section of second youth with its uncontrolled desires and its general inconsistency.

It is interesting that the same physical and the same moral faults are met with at the two periods; that cunning, deceit, untruthfulness, and dishonesty are associated. Their development in single women may lead either to lapse from a virtuous course of life, but more frequently to false accusations. I have met with several instances in which it was very difficult to separate the real from the imagined; in some, slight attentions being misinterpreted, and thus awkward complications may arise; thus from time to time men are almost hunted from their homes by the persistent attentions of such women. In one case, a widow lady at the climacteric got it into her head that a certain general officer wanted to marry her; she admitted that she had never met him in society, yet she felt that in the fitness of things she was meant for him, and that he knew it and recognised it by looking at her in church; she wrote letters to him, which were returned, but this did not satisfy her; in fact she said nothing but a personal interview (which he wisely declined) would serve to throw doubt upon her belief. Nothing one could do would persuade her that her notions were the outcome of change of life, and I regret to say that the delusion outlasted that period, and I fear became an established delusion. Such cases are not very uncommon.

The next class in order consists of those in whom the desire

overrides all control, and I have been told by the husbands of such patients that women who have up to that time been sexually frigid become almost or quite nymphomaniacal. In one case the husband was worn to a shadow and had to seek safety in retreat. Such women, who may have been, as I say, indifferent to sexual pleasures not uncommonly take to masturbation, and some exhaust both natural and artificial means for sexual gratification. I have recently had a lady under my care who, with deep depression, told me that at this period she had indulged in unnatural connection with a pony, and there was no doubt that she had sustained severe bruising about the thighs from some cause. In another person satisfaction was sought by the introduction of large foreign bodies into the vagina.

In one such case the lady made the most straightforward accusation against a man some years younger than herself, and it was quite impossible to say whether there was any ground for the accusation, the probability being that there was, as the woman was comely and certainly had most demonstrative eroticism which might have misled any man ignorant of her mental state. We have then to consider that a considerable number of women at the climacteric have a revival of, or even an outburst of, sexual passion, which may lead to false accusation, to false ideas as to offers of marriage, and may also lead to excess of one kind and another; and perhaps I ought to say a word about treatment, for, after all, it is part of the duty of a reader of a paper not only to point out the roads, but to indicate the best way of getting over them; I have occasionally found bromides do good, but their frequent, I might almost say universal, use in cases of sexual excitement is hardly justified by my experience. Next I have used ext. salix nigra, but again I have to say that its use is only followed by relief in a few cases. I believe that the very hot hip-bath before going to bed, or the sponging of the genitalia with very hot water, gives some relief. I have tried vaginal suppositories of belladonna and of cocaine, but with little benefit. I have been asked as to the removal of the ovaries or clitoris, and I have never supported this operation for the nymphomania of these cases: first, because I have seen cases in which the organs have been removed, but in whom the masturbation has continued, and again, as the disorder may depend on the passing physiological stage, I think it better to wait.

The ordinary symptoms of the climacteric may be induced prematurely by oöphorectomy, and I have some experience that the morbid exaggerations may also occur under similar conditions. I subjoin one instance: a lady, æt. 31, had both ovaries removed; she belongs to a highly nervous stock, but the neuroses before the operation were more of a neuralgic type; since the removal of the ovaries she has been typically "doubtful"; she has always feared that she was not doing what she ought; she has had religious doubts, she has been over conscientious, she had not sufficient control of her thoughts, which seemed to run riot. Her constant worry and weakness is a searching and trying to find out whether things are right or wrong from a religious point of view, it may be either the sayings or doings of herself or of others; thus the patient is ever worrying about possibilities of religious wrong-doing, in a way which is beyond bearing. In the endeavour to find what is right no detail seems too trivial, the result of this microscopical introspection is headache or a feeling of brain fag. In the intervals of comparative calm the dread of a return of the doubt often leads to the very thing dreaded. She says she is sure her head positively searches out things to worry about. She has a great dread lest all this worry should drive her out of her mind. The brain consciousness is one of the greatest troubles. In this case there had been other nervous troubles such as fulness of head, flushing and the like, when she was only 31, almost as soon as the operation was over; she herself has no doubt that the change has distinctly followed this. The prognosis, therefore, is better in consequence.

As I have already pointed out, the tendency of the mental disorder is to melancholia, and with this there are the two chief symptoms to be considered; a certain number of these patients are very suicidal, though there is a general belief that, like hysterical cases, generally they are more given to threats than to acts; but I would at once say no reliance must be placed on this, or you will have reason to regret it. I cannot give very definite statistics as to the number who really commit suicide at this period, but it is large; in some cases it is very determined in character.

A religious involution may be said to occur, and just as with youth, it is common to meet with ecstasy and religious conceit, so with the climacteric, there is very frequently depression, with

ideas of unpardonable sin; there is a vast amount of self accusation, specially of sexual fault or defect of some kind which has been forgotten in the times that have gone, only to revive with declining years, and perhaps with partial revival of desire.

There is one very important point which should not be omitted, and that is the relationship which the climacteric may bear to the mental state of persons who have been insane for considerable periods, or who have had previous attacks of insanity. First, then, I do not think that it is at all common for an established neurosis to pass off at the climacteric; I have no knowledge of any cases of epilepsy ceasing at the menopause as a result of the change; next, though I have seen a good many such patients suffering from chronic or recurrent mania and melancholia, it is in my experience very rare to meet with cases in which the symptoms pass away at the climacteric. I would, however, say that in a few instances about the climacteric I have met with cases of chronic melancholia in which there was no apparent loss of mental power, only oppression, as it were, by morbid grief, in whom recovery has taken place after the change. In the cases of recurrent insanity I, as a rule, expect to find further loss of stability and a tendency to dementia or chronic mental disorder after this time. In chronic delusional insanity I know of no cases in which the period has been associated with recovery.

In some cases, especially those of puerperal insanity, a very common idea is that after the cessation of menstruation, and after the risk of pregnancy is over, the danger of insanity is greatly lessened. I fear my experience does not support this; I have more often met with insanity recurring at this period, and the form of the insanity has been less favourable.

To conclude, then, in my experience neuroses are not uncommonly associated with change of life; they have no specific characteristic; but, as a rule, they tend rather to mental depression, and to insanity with marked delusions, than to the other forms of mental disorder; very rarely is the climacteric associated with any alleviation of already established mental disorder.

As might be expected, with the general change in the reproductive organs, there is disorder of their function, and also there is a marked tendency to disorder of the affective side of women, and as the emotional nature is chiefly concerned in love and in religion, so with disorder of the emotional centre we have symptoms of

religious doubt, and of more or less defect of control of passion. Though the symptoms may pass off, they may produce great trouble in their passage, and one feels that patience and long-uffering have to be preached to the husband or friends rather than to the patient herself.

Climacteric Cases (Bethlem), from July 1st, 1888, to June 30th, 1893.

Number of Cases.—Number of cases = 54.

Mania.—Of the 54 cases 10 were mania, *i.e.*, 20·5 per cent.

Melancholia.—Of the 54 cases, 32 were melancholia, *i.e.*, 57·14 per cent.

Mental Weakness.—Of the 54 cases, 3 were mentally weak, *i.e.*, 5·5 per cent.

Delusional.—Of the 54 cases, 7 were delusional insanity, *i.e.*, 12·25.

General Paralysis.—Of the 54 cases, 2 were that of G.P.I., *i.e.*, 4 per cent.

Average Age.—The average age of the cases in the last five years (of the 54 cases) is 47·25 years.

Married.—28 of the cases were married (including a few widows), *i.e.*, about 50 per cent.

Single.—26 out of the 54 were single women, *i.e.*, about 50 per cent.

First Attack.—45 out of the 54 were *first attacks*, *i.e.*, about 90 per cent.

Second or third Attack.—9 of the cases have had one or more previous attacks, *i.e.*, about 10 per cent.

33 out of the 54 cases have a history of insanity in the family.

16 have no history of insanity.

Heredity.—5 cases the previous history is *not known.*

Therefore, in the known cases there is heredity in 66·2 per cent.

Suicidal.—24 out of the 54 cases are suicidal, *i.e.*, about 45 per cent.

30 of the cases were not suicidal.

Result.

Cured.—17 out of the 54 got well, *i.e.*, 32 per cent.

Uncured.—28 were uncured, *i.e.*, 49·2 per cent.

Relieved.—5 were relieved, *i.e.*, 9·2 per cent.

Died.—2 died, *i.e.*, 3·5 per cent.

Remaining in Hospital and Recovering.—2.

Hallucinations.—34 out of the 54 cases had hallucinations of one or more sense, *i.e.*, 63 per cent. had hallucinations.

20 had no hallucinations (discovered).

Hearing.—Out of the 34 *cases* that had hallucinations, 26 had hallucination of hearing, about 76 per cent.

Sight.—Out of the 34 *cases* that had hallucinations, 23 had hallucination of sight, about 68 per cent.

Taste.—Out of the 34 *cases* that had hallucinations, 13 had hallucination of taste, 38 per cent.

Smell.—Out of the 34 *cases* that had hallucinations, 7 had hallucination of smell, *i.e.*, 20 per cent.

Common Sensation.—Out of the 34 *cases* that had hallucinations, 8 had hallucinations of common sensation, *i.e.*, 25 per cent.

Governesses.—Out of the 54 cases, 8 governesses (including 2 teachers of music), *i.e.*, 14·2 per cent.

Mr. Richards, speaking with the experience of 20 years as superintendent of the Hanwell Asylum, doubted whether the menopause was as important a factor in the causation of mental disease as the author would have them believe. He referred them to the statistical tables prepared by the author, according to which by far the greater proportion of females admitted had developed the symptoms at an age long before the menopause could come into play. This seemed to show that the cessation of menstruation was after all but a minor factor in determining the onset of symptoms of mental aberration. He insisted on the fact that all the symptoms set forth by the author were of an indefinite character, and were met with commonly in many other forms of mental alienation in women. They could not consequently be fairly referred to the cessation of the menstrual function. He observed that in the cases of recurring insanity in which the outbreaks were closely associated with the menstrual function, one might reasonably have expected that the attacks would cease when the menopause occurred. Such was, however, not the case, and in his experience the only change noticed in these patients at the menopause was an alteration in the character rather than the degree of insanity, the recurrent mania being replaced by a tendency to dementia. Referring to the author's suggestion that men might experience a similar crisis corresponding to the climacteric in women, he objected to the idea that this ensued on their retiring from their life's work. He pointed out that many men, military men for example, were pensioned off at 40, and such persons would certainly resent the imputation, for were they not still full of energy? With respect to the assertion that the melancholic type was usual in connection with sexual changes, he pointed out that the prevailing type of insanity for some years past had been in the direction of melancholia, with or without depressing delusions; so that it was hardly permissible to assert that the melancholy bias was the necessary

consequence of the changes bearing on the sexual organs. He pointed out that the author had given, in the tables shown, 32 as the number of melancholics admitted at or about the menopause, but to this number ought to be added many of those who were grouped under the head of delusional insanity, seeing that the delusions in those cases were frequently of a depressing nature. The author had not told them whether the persons who had developed mental symptoms at the menopause were persons who previously had been perfectly healthy, or whether there had been traces of insanity before.

Dr. Julius Althaus observed that the opinions expressed by the author and the last speaker represented the two opposite currents of opinion now prevailing. He was inclined to side with the author in believing that there was a connection between certain diseases of the brain and other parts of the nervous system and the profound physiological change comprised in the menopause. He had met with cases in which women who had been perfectly healthy up to that time had then developed symptoms of insanity. This was more particularly the case when the change took place suddenly. Where the change was gradual and spread over several years women were less likely to resent the change than when it was sudden in its advent. Insanity had also been observed when the menopause was induced prematurely and artificially by gynæcological operations, such as double ovariotomy and removal of the appendages; but there was, unfortunately, very little accurate information as to the special forms of insanity occurring after such operations. From what he understood there appeared, however, to be two principal forms of it, viz., acute delirium lasting a few days or a week, and a condition of profound melancholia lasting much longer. He referred to the recent discoveries of the effects following removal or atrophy of the thyroid body; and observed that if they could learn more of what actually took place after removal of the appendages or after double ovariotomy, they would be enabled to compare these results with those of other clinical observations, and, ultimately arrive at a true knowledge of the nervous sequels of the menopause. He had seen a good many cases of neuroses, not so much actual insanity as such, though on the borderland of it, in which it was utterly impossible to find out any other cause, remote or proximate, than the supervention of the menopause, which had come on suddenly. Under these circumstances he had seen symptoms of pseudo-general paralysis present themselves in women. In some instances recovery had taken place gradually, without any particular line of treatment, while in others energetic treatment had been attended with the happiest results. He pointed out that epilepsy was of rare occurrence as commencing during middle life in women, and most of the cases he had seen between 45 and 55 had come on soon after the cessation of menstruation. The first fit might make its appearance within a week or ten days after the last sign of the flow.

Dr. Griffith said that it was necessary not to take an exaggerated view of the importance of the climacteric changes, which were not to be assumed to be identical with those which occurred after oöphorectomy. In the one case the ovarian and uterine functions ceased suddenly, in the other gradually; the ovarian preceding the uterine by some years; the evidence of this being that most women who begin child-bearing at the usual age, namely, between 20 and 25, cease child-bearing some 10 years before the menopause, though living under precisely the same condition as before; this in the absence of disease could only be explained on the

supposition that the ovaries ceased to produce ova capable of fecundation. This gradual cessation of function was probably a very beneficial provision of nature. His experience in a very few cases of mental trouble associated with symptoms of disease of the pelvic organs at various periods of life amounted to this, that in the absence of grave disease the pelvic condition was of very little importance.

Dr. Cullingworth observed that gynæcologists had a word to say on this question because they got the slighter cases, in which the phenomena did not bring the subject under the notice of alienists, or to institutions like Hanwell. Before any opinion could be formed as to whether or not it was common for nervous or mental disorders to be associated with the menopause, they must take note of both the slighter and the more severe cases. The alienist and the gynæcologist must compare notes. No one could attend a gynæcological out-patient department for many weeks without becoming perfectly satisfied that the author's main contention was correct, viz., that there were considerable numbers of women, not more nervous than their fellows until the menopause, who, at that period, develop the symptoms Dr. Savage had so graphically described. He looked upon this part of the experience in the out-patient department as educationally most important and valuable. Very few women at the menopause escaped altogether from mental symptoms. His own impression was certainly that a much larger proportion of women suffered than would appear from the statistics brought before them by the author. He was much surprised to find so many cases of acute mania associated with no menopause and indeed of so many cases not marked by melancholia. Such cases, however, would obviously be more likely to come under the author's notice, just as in his own practice milder cases would be met with which would never come under the author's observation. In this way the author had an undue preponderance of certain forms, while the gynæcologists got a preponderance of other forms. He agreed with Dr. Althaus as to the desirability of obtaining fuller information as to the mental disturbances which were sometimes described as having followed oöphorectomy. He himself had never seen an instance in which mental disturbance had followed removal of the uterine adnexa, possibly because he had never removed the ovaries for the relief of neuroses, in other words he had never removed normal ovaries, except in certain cases of fibroid tumours of the uterus, &c. When the operation was undertaken for obvious disease of those organs he did not believe that mental troubles would be likely to follow. He could not accept Dr. Griffith's view. After double ovariotomy for the removal of diseased uterine appendages, the patient was often seized with flushings and a certain amount of depression. He agreed with Dr. Savage that it was a great flaw in the gynæcological text-books that so little allusion was made to the subject of the paper.

Mr. Richards had had under his care for several weeks a highly intellectual lady who, at the age of 33, developed disease of the ovaries, on account of which they were both removed by a well-known London gynæcologist. Within six weeks of the operation her friends began to notice a change in her character, and shortly after she began to have delusions. She thought, for example, that she had been changed at birth and refused to allow herself to be addressed by her name and so on. The changes subsequently took the melancholic type, and she had gone on from bad to worse. He himself firmly believed that the removal of the ovaries had determined the mental condition. The ovaries were described as exhibiting the lesions of cystic fibroma.

Dr. Routh said alienists ought to ascertain the condition of the reproductive organs in women who developed symptoms of mental aberration at the menopause. He referred to the observation of Dr. Keith, who put the proportion of women who went mad after hysterectomy as something like 10 per cent. It was possible that the operations and the mental aberration did not stand to each other in the position of cause and effect, but this was a point that ought to be cleared up by statistics. Many women whose appendages were removed experienced mental depression of a very marked type. These symptoms were the same as at the onset of the menopause.

Dr. Savage, in reply, admitted the justice of Mr. Richards' criticism. The absolute number of female patients admitted to asylums was greater between the years 20 and 30, but, relatively to the number living at the time, the preponderance was greater at the time of menopause than in the earlier period. His own statistics showed that the climacteric occupied a very secondary position as a cause of insanity generally, the 54 selected cases only representing from 6 to 7 per cent. of all the patients observed, that is to say, about a third of the patients who had broken down at an age at which the menopause might be invoked. He agreed with what had been said as to the inutility of the menopause in relieving chronic mental disorders. The symptoms in men, to which he had alluded as analogous to those observed in females at the menopause, applied to elderly men who had retired suddenly from their life's work, and not to men who were pensioned off at 40 to begin life afresh. Two cases of general paralysis out of the 54 cases was certainly a large proportion, and was greater than he anticipated. Yet the figures are about the same in his private practice. He willingly conceded that great assistance could be rendered by gynæcologists who meet with cases which do not come under the observation of alienists. He agreed with the suggestion that they ought to make a systematic examination of the reproductive organs of their female patients. When he was in America he visited asylums which were provided with lady doctors who made a practice of investigating the condition of these organs, but he failed to discover any useful result either in clearing up questions of causation or in advancing treatment. A lady doctor had now been appointed at Holloway's institution, and he hoped later on to be favoured with the results of her observations.

THE HEART AS A GUIDE TO TREATMENT IN INFANTILE CONVULSIONS.

By Alexander Morison, M.D., F.R.C.P. Edin., M.R.C.P. Lond.

By infantile convulsions I mean that group of phenomena, commencing with clonic muscular contractions and ending with coma, which may not all be met with in every case, but which are sufficiently often associated to form one clinical picture. If the fit occur during the day medical assistance is usually sought during the preliminary and most frequently convulsive stage of the disorder; but should it occur during the night this stage may have passed before the condition of the child has attracted attention, and the physician may then find the patient comatose. Objectionable as it may be in principle to describe a disease by a sign or symptom, there is a tacit concession of the convenience in some cases of emphasising a dominant feature. While, moreover, the removal of a cause is the scientific procedure in rational therapeutics, that cause, and therefore the essential nature of the disease, may be obscure; while an urgent symptom may point the quickest road to death and indicate at the same time the direction the immediate efforts of the physician should take in his endeavour to save life. It is because the case I am about to relate came within this category that I have used a symptomatic rather than pathological nomenclature. So grave were its features, so apparently consequent the action of the chief therapeutic agent, and so gratifying the general issue that I made very complete notes at the time and reproduce them verbatim.

"L. B——, a female child 19 days old, was in good health on July 9th, 1881. At 10 A.M. on that day she had half a breakfast-cupful of thin oatmeal gruel (grits): at 3 P.M. "the bottle," with about one ounce of milk and water (1 to 3); and at 8.30 P.M. half an ounce of oatmeal gruel. In the interval between these times, being more restless than usual, she was suckled more frequently than ordinarily, and her mother said that 'she took the breast very freely indeed.' Since she was three days old she has had more or less gruel, and also cow's milk and water, and last, but not least, the mother's milk. The infant may, therefore, be said to have been on tolerably full diet, and considering the

normal absence of the salivary secretion, not under the best conditions for the digestion of farinaceous food. The child was stated not to have taken any narcotic drug—an important point, as the context will show. On July 10th, about 12.30 A.M., the child was noticed to be breathing heavily, but was not further observed till 4 A.M., when she was applied to the breast, but would not suckle, and was again seen to be 'breathing hard.' A teaspoonful of castor oil was given her, she was placed in a hot bath, and I was sent for. She was seen by me at about 5 A.M., when her condition was as follows:—Respiration was about 12 per minute, very slow and infrequent, and prolonged into a stertorous snore, such as one observes shortly before death; the heart's beat was about 10, 15, and 20 per minute; the body was cold; the patient was unconscious, and the pupils were both contracted to the size of a small pin's head. The hot bath, with mustard poultices to the chest, abdomen, and back, served to rouse the circulation and respiration temporarily, but the lethargic coma again supervened. There was no convulsion of the limbs, neck, or trunk, which were perfectly limp; but there was occasionally a convulsive quiver of the lips, with a rapid convulsive protrusion and retraction of the tongue at the same time. I used ether inhalation with artificial respiration with very transitory benefit. At times the heart was inaudible, and the respiration was so infrequent and the body so limp that I was uncertain whether the child were not dead. I then determined as a last resource to use tincture of belladonna in such doses as to produce, if possible, an immediate effect on an apparently moribund subject. I accordingly injected a small teaspoonful—as nearly as I could judge from 40 to 60 minims—with a little water per anum (not having with me a hypodermic syringe), and, having waited for two or three minutes without observing any effect on the contracted pupils or on the heart's action and respiration, gave per os, and pushed well down the throat so as to be swallowed, about half a teaspoonful of the same tincture of belladonna, with ten drops of sulphuric ether. In a few moments, and quite suddenly, the pupils dilated to about three millimetres in diameter, and forthwith the heart began to beat rapidly. This acceleration continued for a longer time and was much more marked than that which followed any previous excitant; but it, too, at length began to yield to the comatose lethargy which appeared to be invincible. I therefore again gave by the

mouth a similar quantity of tincture of belladonna and ether, which was followed by a further dilatation of the pupils and increased cardiac acceleration. In all, the child had per anum and per os 90 minims of tincture of belladonna (B. P.) and from 20 to 30 minims of ether in addition to that inhaled. I should have mentioned that I emptied the bowels by enema, passing my little finger through the sphincter ani to evacuate all fluid, &c., before injecting the belladonna. At 10 A.M. the pulse was 156, the temperature was 100·2° F., and the respiration was 72. There were frequent convulsive twitching and action of the tongue as above described, both pupils were dilated, the patient was unconscious, and reflex action was easily provoked. Ten grains of bromide of potassium were given. At 12.30 P.M. the pulse (heart) was 202, the temperature was 104°, and the respiration was 96. I applied a handkerchief which had been dipped in iced water to the head, and gave a little iced water. Sudden failure of the heart's action followed—that is, it rapidly slowed till it became inaudible—with cessation of respiration and fall of temperature. Artificial respiration was tried by squeezing the abdomen and bending the body forwards; then pressure was removed from the abdomen and the body bent backwards. Returning respiration came in infrequent gasps, sometimes accompanied by a whooping cry. About 12 minims of brandy in water were injected per anum, with immediate acceleration of the heart and respiration, and rise of temperature; she was quite unconscious. At 5 P.M. the temperature was 102° and the pulse 186, and the patient was more sensitive. At 9.25 P.M. the temperature was 102·6°, the pulse was 192 and sensibility was greater, and the pupils were still dilated, but less so; the back was vesicated by the hot-water bottle; she had not urinated since 11 A.M.; linimentum calcis was applied for the burn. On July 11th the patient urinated at midnight, and freely again at 10 A.M.; the bowels acted at 8 A.M. and 9 A.M., the discharge being stringy and mucoid; the pulse was 156, the temperature 101·4°, and the respiration from 48 to 60. The vesication was better; the patient was quite sensitive, cried lustily, and was suckled three times; the pupils were still dilated, but rather less so, and feebly responded to light; the globes of the eyes moved freely, which they had not done on the previous day; the right especially was turned up and everted; the abdomen was still a little tympanitic, but less so than the day before. 60 minims of castor oil

were given; the child was directed to be suckled by the mother entirely and not more frequently than every two hours. At 6.25 P.M. the temperature was 99·6° and the pulse 156; the bowels had acted three times; she was crying, apparently from hunger, judging from the action of the lips and the tongue; the pupils were still dilated and did not respond to candle-light. On July 12th, at 12.45 P.M., the pulse was 126, the respiration 54, and the temperature 98·8°; the bowels had acted, and she had urinated freely; the pupils responded naturally to light, but were slightly dilated. Treatment was now directed to two scalds on the back from a six ounce hot-water bottle, and mustard poulticing; otherwise the child was well. I may add that she is now a healthy, well-grown girl 12 years of age, who has never had any further convulsive seizure, and that there is no history of a special liability to fits in the family."

Notwithstanding the tendency of authorities to condemn attempts at the classification of convulsions, there can be little doubt that it would be desirable for practical purposes were it possible to disentangle from the *mêlée* of symptoms which are grouped under the general term certain types of disturbance. This has already been done in the case of laryngismus stridulus, and might, I think, with advantage be attempted in some other instances; for there is no reason why that sign should monopolise importance when there are many others quite as important and constant as it. An attempt to classify convulsions according to their exciting cause, if of some use in practice, has not necessarily a very distinct relation to the type of effect. Henoch,* for example, relates the case of a child two years of age who, having partaken of some saurkraut, manifested unusual sleepiness with irregular respiration, but whose pulse beat 120 times in a minute. In the case which I have related there was a like origin in indigestion, but there was also a prolonged inhibition of cardiac action which reduced the pulse-rate to an abnormal slowness. While, therefore, recognising the difficulty of distinguishing the chief lines of explosion in many cases of infantile convulsions, and without attempting to reduce these to order or law, it has appeared to me that there would be some practical utility in taking the condition of the heart's action as an index to treatment, and in empha-

* 'Diseases of Children,' translation of the Sydenham Society, p. 169, vol. i.

sising this by a recognition of it in the symptomatic nomenclature of the disease.

In developing this line of thought I would refer to a case which I had an opportunity of seeing with Dr. Ostlere, of Stoke Newington, not because of the rarity of such cases, but because its phenomena contrasted in most respects with my case, and because it seemed to respond as directly to a particular mode of treatment. Dr. Ostlere has kindly given me the following notes. A male child 13 months old and previously in good health, fell out of his perambulator on October 28th, 1892, and struck the back of his head. Next day he was seized with general convulsions. Dr. Ostlere quieted him with a chloroform inhalation, and left him apparently asleep, with a pulse of 130 and a temperature of 104° F. On the 30th the child had choreic movement of the limbs, was constantly protruding the tongue and opening the mouth "as if trying to retch," and had dilated pupils, which responded to light, with a pulse of 120 and a temperature of 102°. Bromide of potassium was prescribed. Two hours later the muscular jerking is stated to have been limited to the right arm and leg "when disturbed," the abortive retching continued, the pupils were normal, and the pulse was 130. Next day, being the fifth of the illness, the child is noted to have been very quiet, to have noticed objects, and to have had a green watery diarrhœa. The pulse was 120 and the temperature 101°. Next day Dr. Ostlere notes that there was "more rolling of the head and jerking of the limbs on the right side. The pulse was scarcely perceptible and was uncountable; heart's beat by stethoscope from 220 to 230; temperature 101° and respiration 40; diarrhœa continues; takes the breast; 5 minims of digitalis were prescribed to be taken every four hours." On the seventh day of the illness the child remained in much the same condition. "The pulse was from 220 to 240; respiration from 50 to 60; diarrhœa; twitching limbs; no sickness; pupils dilated and acting." On the evening of this day I had an opportunity of seeing the case with Dr. Ostlere. The pulse, counted with the stethoscope, was 238 a minute, the respiration about 60, and the temperature 100·5. We agreed to apply ice to the head. Bromide of potassium was also prescribed. The remainder of the report I copy *verbatim* from Dr. Ostlere's notes: "Saturday, the eighth day: seems stupid; no crying; diarrhœa a little less frequent; takes the breast. They had applied ice in a

bladder very irregularly, they said, as the child had begun to cough from the cold, as they supposed, so they left it off; in fact, I do not think they had used it for many minutes. Pulse from 200 to 210; respiration 58. Ordered ice-cap to be applied continuously. Sunday: child quiet; looking more sensible; diarrhœa better; pulse 120; respiration from 45 to 50. To keep on ice until evening. Monday: pulse 104; respiration 35; temperature 100°; cries on being disturbed; still jerking right arm and leg at intervals; seems to notice everything. I ceased attending after next day as the child was feeding and sleeping well, with no trace of the choreic condition, and a pulse of 94."

Whether some cases of what I may venture to term infantile tachycardial eclampsia, to distinguish them from cases such as that first related, are originally, and for a longer or shorter period, bradycardial, it is difficult to say, as it is rarely that the physician has an opportunity of seeing the patients at the commencement of symptoms. Writers frequently refer to an initial pallor, which it is theoretically possible to conceive as associated with cardiac arrest or inhibition; but cardiac action, to impress its character upon the symptomatology of a case, must be of a more persistent nature, as it was in the two typical instances adduced, and their successful treatment was based upon a recognition of the cardiac state. It is a commonplace of experimental physiology that direct or reflex irritation of the pneumogastric nerve produces an inhibition of the heart's action, and that this inhibitory influence of the vagus is abolished while the organism is under the influence of belladonna. It was a recollection of this fact, together with the history of the administration of improper food, that caused me to give that drug in the bradycardial case I have related. Professor Michael Foster* states that "after atropine, even in a minute dose, has been injected into the blood, stimulation of the vagus, even with the most powerful currents, produces no inhibition whatever." It is interesting in view of this fact, however, to note that the sedative action of cold to the head while my patient was fully atropised seemed to cause a very sudden failure of the heart's action, as I have stated. In Dr. Ostlere's essentially tachycardial case, however, notwithstanding the length of time for which the child had been affected, and perhaps, also, because the patient was

* 'Text-book of Physiology,' p. 171, third edition.

older, the continuous application of ice to the head, as far as could be judged, was directly curative.

If my treatment in the case first related should appear to have been somewhat too heroic, I must plead the justification of success and the apparent extremity of the patient. Under similar circumstances I should certainly act on the same lines again, but should prefer the hypodermic injection of a smaller dose of belladonna or its equivalent in solution of atropine. As is well known, children tolerate preparations of belladonna better than adults. The generally acknowledged fact that very small doses of opium are frequently extremely prejudicial to young children would, *a priori*, suggest that larger does of belladonna would be tolerated by them than one might otherwise suppose. Dr. Fuller proved this to be so in the case of 12 choreic children treated by him in St. George's Hospital. In a paper entitled "On the Administration of Belladonna and the Causes which modify its Action," read before the Royal Medical and Chirurgical Society in June, 1859, he stated that "adults cannot tolerate doses of the drug which can be taken with impunity by children." I would suggest that it would be interesting to inquire whether, in the case of a certain drug being "badly borne" by an individual from idiosyncrasy or disease, its physiological antidote is tolerated better than usual. I have not, however, been able to discover many particulars of the use of belladonna in infantile convulsions, although it has been so used, and perhaps it is calculated to be of most benefit in those cases in which there is a tolerably clear history of pneumogastric irritation. Dr. Charlton Bastian, who writes the article on Convulsions in 'Quain's Dictionary of Medicine,' speaks of the benefit accruing from a combination of quinine, belladonna, and bromide of potassium in some cases, but gives no special indications for the use of belladonna. *A priori*, one would expect it to be most beneficial in those cases in which physicians* have found nitrite of amyl to be of use.† I should, however, hesitate to employ either the one or the other were tachycardia present, and that because in infantile convulsions with quick heart and dilated pupil I have found belladonna to be as

* Dr. Eustace Smith: 'Disease in Children,' p. 300. Dr. A. E. Bridger: 'Lancet,' April 22, 1882.

† Dr. Eustace Smith considers it is especially indicated in the convulsions which complicate whooping-cough. *Op. cit.*, p. 300.

useless as it was useful in the case of L. B——, in whom the phenomena were of an opposite kind, and resembled very closely those of opium poisoning, from which it could only be distinguished by the presence of the limited convulsions related and the absence of a history of narcotic drugging.* The case recalled to my mind one of opium poisoning which I noted some years previously. A healthy male infant six weeks old was given 50 minims of laudanum by his mother, who was suffering from puerperal mania, at 8.30 A.M., on November 6th, 1878. I saw the child at 9 A.M., when it was comatose, had a slow pulse and respiration, lids half closed and languidly raised on slapping the surface of the body, skin cold, and pupils contracted to pin points. The use of the stomach-tube, external excitation, and artificial respiration had little effect, but the hypodermic injection of a solution of atropine in small doses never failed very rapidly to quicken both pulse and respiration, and warm the surface. The child was thus kept alive for 15 hours, when it ceased to respond to treatment and died. Although one-tenth of a grain of the alkaloid in all was injected, and an additional one-twenty-fourth of a grain was given by the mouth, the quantity was possibly too small to neutralise the effects of the original poison. I regret that I had not an opportunity of observing the effect upon the pupils of the atropine injected, as some was dropped into the eyes when the child was fully comatose and before he had time to absorb the few drops given by the mouth previously to hypodermic injection. The pupils were thus dilated by the local application. Graves found belladonna of use in continued fever with contracted pupil and coma, and Dr. Thomas Anderson, arguing from this experience, was the first to use the drug as an antidote for opium poisoning.† When, on the other hand, tachycardia is present, ice on the head is very effectual both as a febrifuge, if there be concurrent fever proportionate to the pulse-rate, and as a means of "pulling up" a "runaway heart" when fever is absent or not calculated to cause the rapidity of heart present. In the latter instance ice

* The diagnosis of post-eclamptic coma with contracted pupils from the coma of opium poisoning, in the absence of an avowed knowledge of the administration of opium in the form of "soothing syrup," or in any other vehicle, must always be very difficult, if not impossible, clinically; but the indications for treatment are fortunately the same.

† 'Edinburgh Medical and Surgical Journal,' April, 1855.

appears to act—(1) by direct sedation on the cardiac centre, and (2) by raising the blood-pressure generally by a tonic influence on the peripheral vascular system through the vaso-motor centre.

Unlike the bradycardial case that forms the basis of this paper, such cases, on the other hand, present a close resemblance to the effects of belladonna poisoning, and while opium in the case of children is a double-edged weapon, its cautious use would be warrantable if the usual treatment by chloroform anæsthesia, bromide of potassium, or chloral proved ineffectual. Personally, I have had no experience of opium in such cases, because my fear of its effects on infants has always held my hand, but Dr. Hughlings Jackson advises its use under certain circumstances in the form of Dover's powder. The cases in which he uses it are those in which there is least evidence of depression, and these are usually such as evince cardiac acceleration.* Dr. Eustace Smith† also recommends the hypodermic injection of one-twenty-fourth of a grain in a child 12 months old when the case resists other treatment. There are some other points in this connection which are worthy of consideration. The child L. B—— was unconscious certainly from 5 A.M. on the 10th till 12.30 P.M. the same day, and probably for some time longer, while the contraction of the pupil was undone by belladonna and the heart's action synchronously released from inhibition between 5 A.M. and 6 A.M., and remained so, the former till 12.45 P.M. on the 12th, when they are noted as still being somewhat dilated, and the latter at the same date and time was practically normal. The acceleration of the heart and dilatation of the pupil, therefore, were not accompanied by a restoration of consciousness, although the pulse-rate, temperature, and respiration noted within that period indicated a vigorous flooding of the textures with blood. Dr. C. West‡ considers that "convulsions in the infant answer to delirium in the adult." Whether, however, we accept this dictum of so much respected an authority or not, unconsciousness will, I think, be generally regarded as an identical phenomenon at all ages, although its associated signs may differ somewhat. If this be so, the clinical history of L. B—— would seem to indicate that a restoration of diminished blood supply is not alone necessary to a restoration of

* 'Reynolds's System of Medicine,' vol. ii, p. 239.

† *Op. cit.*, p. 300.

‡ 'The Diseases of Infancy and Childhood,' sixth edition, p. 35.

consciousness in such cases. The latter would then appear to depend upon a change in the cerebral nerve cells of a more intimate character—a change the chief sign of which is the unconsciousness in question, and which, if in the first instance active in the production of peripheral manifestations such as dilatation or contraction of the pupil and acceleration or retardation of the heart's action, cannot later be correctly measured by these.

Physiologists, again, have shown that the behaviour of the divided and stimulated cervical sympathetic, as regards its action upon the pupil, differs apparently from the effect of the same process on blood-vessels; for whereas the former is dilated the latter are contracted. The contracted pupil, therefore, so far as sympathetic irritation is concerned, is not brought about by the same mechanism as the contraction of blood-vessels, but appears in such cases, like the pupil of sleep, to be the result of anæmia of the brain and eye, and due in this instance to reflex spasm or bloodlessness of the cerebral vessels; or, like the pupil of chloroform and opium narcosis, to sedation of the nerve elements, with diminished functional activity. The dilated pupil of infantile convulsions, on the other hand, might conceivably accompany vascular spasm and be due to a like sympathetic irritation, for the retraction of the dilator iridis—an active dilatation of the pupil—would indicate spasm of the muscle under sympathetic innervation. One must, however, apply the conclusions of physiologists to practical medicine with caution, for in the patient we usually have a comparatively intact organism, with nerve junctions complete, and in which, therefore, a more complete mechanism has play than in the vivisected animal. Thus, in Claude Bernard's famous experiment, division of the sympathetic was followed by contraction of the pupil and dilatation of blood-vessels on the same side of the head—conditions, it is stated, which may subside in a few days, notwithstanding the removal of the superior cervical ganglion.* At the bedside, however, dogmatism is sometimes even less admissible than in the physiological laboratory. Thus, I have notes of a case of double pleuro-pneumonia, which was under my care some years ago, and which recovered, in which, while both lungs were "resolving," the patient had a circumscribed flush on both cheeks over the malar bones. When the right lung had in great measure recovered, the flush only appeared

* Foster, *op. cit.*, p. 192.

on the left cheek, on which side, also, the pupil was distinctly dilated. The left side of the face was likewise hyperæsthetic. These phenomena usually continued for about two hours each morning for a time, and could not be accounted for by decubitus or pressure. Here vascular coincided with pupillary dilatation, and was apparently curiously related in some manner to the removal of inflammatory products in the lung on the same side. Physiologists have demonstrated the influence of stimulation of afferent nerves in producing a reflex spasm of the vascular system.* In the case of L. B—— the *rationale* of the conditions which presented itself to my mind was the generation by irritation, in the digestive apparatus, of afferent impulses passing up the vagi, and resulting in pronounced cardiac inhibition, with peripheral anæmia. Professor Foster appears to regard the direct inhibition of the heart by vagus irritation as of like mechanism with the vascular dilatation which follows faradisation of a severed nerve such as the chorda tympani, and that, I presume, would establish a resemblance likewise with the heart of syncope, which one knows may result from emotional stimulation of the vagi. But the pupil of syncope is a dilated pupil, and seems to depend upon the general lowering of cerebro-spinal "tonicity," which results in vascular and muscular relaxation, and, when less extreme, in the disturbed metabolism and general atony of the neurasthenic invalid. In cases, therefore, in which we find syncopal states associated with a contracted pupil—a spasmodic, not paretic, condition of a muscle innervated by a cerebral nerve—and in which we can exclude narcotic poisoning, we must seek some other solution than that of a cerebro-spinal exhaustion. In the case of L. B——, therefore, associated as it was with a contracted pupil and apparently blanched brain, it is probable that the anæmia in question and retarded heart were associated with reflex vascular spasm. As, moreover, the afferent impulses active in the production of this state presumably travelled up the pneumogastric nerves, the atropisation of the patient was calculated to remove this casual element. That it did so may, I think, be fairly argued.

It is not remarkable that the behaviour of a structure so visible and so sensitive as the pupil should have been a favourite study both of physiologists and physicians. References to the subject

* Foster, *op. cit.*, p. 188.

are common in the text-books and periodicals of both branches of the profession. The clinical value of this sign, however, in any particular case has to be very carefully weighed. It may be of little consequence, or it may be all-important, but with pupillary contraction or dilatation in relation to more localised disease we are not at present concerned. That the relation of the general vascular tone to the state of the pupil is a constant one will not, I presume, be questioned. Watching beside a dying patient I have seen the pupil dilate widely and permanently at the moment of death. On another occasion which has impressed itself upon my memory a patient who had suffered from severe tonsillitis for some days, and who had refused food, on my puncturing his tonsil with a bistoury, fell back on his bed apparently dead. His heart and respiration ceased, his muscular system became quite flaccid, and the signal for these grave phenomena was a sudden and permanent dilatation of both pupils. He was fortunately resuscitated by artificial respiration. When, therefore, one meets, in cases in which there is a widespread disorder of the nervous system, as in infantile convulsions, with a slow pulse and contracted pupil, there is, I would suggest, sufficient reason to assume that we have to do, not with a cerebro-spinal syncope, but with a powerful reflex vascular spasm in the first instance, associated with retarded cardiac action and rise of blood-pressure. It is probable, however, that another factor in the condition is the state of the nerve elements in the central nervous system induced by the preceding conditions of original stimulus of a nerve or nerves, and consequent arrest or diminution of blood-supply to the affected centres. Beyond this point speculation would at present be unwarrantable, although it is to be hoped that the changes inducing a disturbance of sensibility, and which precede observable histological changes in nerve cells, may yet come within the sphere of knowledge. At present the existence of these states is notified only by the occurrence of so-called "functional disorders." On the other hand, whilst one may admit that it is theoretically conceivable that dilated pupils may in such cases be associated with vascular spasm—and Dr. West* says that the pupil is either immovably contracted or dilated during the fit—if a dilated condition of the pupil be accompanied by a quick and feeble heart's action, it will, I think, usually be found to be associated with a paretic and syncopal state.

* *Op. cit.*, p. 39.

That the heart may be accelerated from other than peripheral vascular causes is well known. In a paper on the "Origin from the Spinal Cord of the Cervical and Upper Thoracic Sympathetic Fibres"* Mr. J. N. Langley has shown that the first and second thoracic nerves appear to be most potent on stimulation, both to dilate the pupil and to accelerate the heart, and that such acceleration may be obtained independently of a rise in blood-pressure. That some forms of emotion also act thus is a common experience; but that very want of language and intellectual activity which, as Dr. West† and others have remarked, renders the diagnosis of disease in children at times so difficult, has this countervailing advantage that it excludes in a great measure the disturbing factors due to emotion, which, when present, render it difficult to estimate aright the cause of some symptoms and the effect of some drugs. This fact, I would submit, only imparts greater value to the cardiac state regarded as the key to the treatment of infantile convulsions.

November 13th, 1893.

VOTE OF CONDOLENCE TO LADY CLARK.

Before proceeding with the ordinary business of the meeting,

The PRESIDENT alluded to the loss which the profession had sustained in the death of their former President, Sir Andrew Clark, which had so unexpectedly occurred since their last meeting. He said that the deceased gentleman was by common consent wanting in none of the characteristics of a really great man; he was indeed a man of great and sterling qualities, an excellent man of business, genial, generous, and truthful towards all those with whom he had to deal. He himself could look back on an acquaintanceship of 40 years with the deceased gentleman, but he had never so fully appreciated his qualities as since he had been President of the Royal College of Physicians, in which capacity he had displayed the greatest self-sacrifice and devotion. He had throughout given precedence to the ordinary business of the College over all other work of every kind. Sad as was the tragically sudden end, he ventured to believe that the end was exactly what Sir Andrew would himself have chosen; for he, of all men, would have preferred to die, so to speak, in harness. He moved that a vote of condolence be forwarded to Lady Clark.

Mr. BRYANT briefly seconded the motion, saying that Sir Andrew was too well known for it to be necessary to pronounce his eulogium. He

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* 'Philosophical Transactions of the Royal Society,' 1892.

† *Op. cit.*, p. 3.

alluded to the high sense of duty and the self-sacrifice with which he threw himself into whatever he had in hand.

A CASE OF AXIAL ROTATION OF THE TESTIS.

By Edmund Owen, M.B., F.R.C.S.

A schoolboy, 13 years of age, was admitted to St. Mary's Hospital on June 16 last with a swelling in the left inguinal region. He said that the testicle had never come down on that side, and that two days before, after bowling at cricket, the swelling had appeared. He at once felt very ill, and he vomited. Two boys helped him home, and he was then put to bed, where he had remained until his admission into hospital. Mr. Owen was immediately called to see him as a case of "strangulated hernia." Just outside the left external abdominal ring there was a tender swelling of about the size of a small hen's egg. There was no impulse in it; the skin over it was not discoloured. The boy was in considerable distress.

On gently dragging the tumour downwards, it was found that the spermatic cord and the external abdominal ring were free and clear; the tumour could not, therefore, be a hernia. As there was no history of injury it was not likely that the swelling was either a hæmatocele or an inflamed testis, probably a testicle which was engorged as the result of axial rotation of the cord. On cutting down to the testicle, however—which was done at once—the cord above the tumour seemed to be neither twisted nor congested. The distended tunica vaginalis was then opened, and a good deal of blood-stained serum escaped. At the back of the cavity there was the swollen testicle; it was gangrenous in appearance, though not in smell. Having tied the cord and removed the testicle, it was noticed that the upper part of the tunica vaginalis still contained fluid, and that it was shut off from the rest of the serous cavity—which was now wide open and empty—by an oblique groove. Further investigation showed that this groove lay exactly over an outward half-rotation of the cord, which was sharp and sudden. As soon as this twist was unfolded, the upper cyst of the tunica vaginalis emptied itself into the lower, the blood-stained fluid escaping as the two parts of the sac once more became continuous.

The upper part of the tunica vaginalis had no communication with any funicular process, and there was no sign of hernia; but, as often happens in the case of an undescended testis, the tunica vaginalis was extremely capacious, extending well above the epididymis, and as the half-turn which the cord took was immediately at the top of the epididymis it so happened that the tunica vaginalis was itself caught in the twist, a small part of the serous cavity being thus nipped off and isolated. It was this upper distended sac which had hidden the twist of the cord until the testis had been removed. Judging from the readiness with which the swollen mass allowed itself to be lifted out from its bed, it was thought that it possessed no mesochorium. The boy returned home cured in less than a fortnight.

Though potential gangrene of the testicle, as the result of rotation of the spermatic cord, can evidently not be a new disease, yet it is only since the publication of Mr. Gifford Nash's account of Mr. Whipple's case, and of Mr. Bryant's paper read at a meeting of the Royal Medical and Chirurgical Society, that attention has been specially directed to the subject. Since then several similar cases have been brought to light, and I propose very briefly to detail the features of chief importance in each of these records. Mr. Whipple's patient was a boy 16 years of age, with an undescended testicle on the left side. He felt something give way on straining, and, having vomited, he was sent to the Plymouth Hospital as a case of strangulated hernia. The swelling was hour-glass in shape, of which the upper part, against the external ring, proved to be a strangulated, claret-coloured epididymis, while in the lower part of the sac was the testis. The sac contained blood-stained fluid and a piece of omentum. "The epididymis appeared to be twisted twice on its own axis," but the direction of the twist is not stated. The swollen tissues were removed, and a radical cure of the hernia was effected. The boy left the hospital in less than three weeks. The specimen is in the museum of the Royal College of Surgeons of England.*

Mr. Bryant's case was reported to the Royal Medical and Chirurgical Society on February 23, 1892. A boy, 15 years of age, had a swelling in the left inguinal and scrotal regions, with symptoms suggestive of strangulated hernia. On opening the vaginal sac, black blood escaped. . . . The strangulated testis

* Reported by Mr. Gifford Nash in the 'Brit. Med. Jour.,' June 6, 1891.

was "coal black." The cord had undergone three half-twists outwards. The testicle was saved, but it atrophied subsequently. On the same occasion Mr. Bryant reported the case of a man, aged 23 years, who had been treated by Professor Keen, of Philadelphia. He had from birth been troubled by a reducible hernia and an undescended testis on the right side. On exposing the tender swelling he found a considerable extravasation of blood. "The testicle had been rotated three half-turns," but in which direction the report does not state. Professor Keen tied the cord, removed the testicle, and effected a radical cure of the hernia. The blood-vessels of the testis were thrombosed, and many of them were ruptured.

Mr. Davies-Colley's case* was that of a boy, 14 years of age, with an undescended testicle on the right side, which, at the operation, was found to be twisted "three turns" to the patient's left—that is, inwards. The operation was completed by stitching the "black mass" in the scrotum. There was no hernia or funicular process. "The greater part of the testicle sloughed away."

Mr. Herbert Page's case† was that of a lad, 17 years of age, who had been in the habit of wearing a truss for a congenital hernia on that, the right, side. On cutting down, the testis was found to be gangrenous, the cord being twisted "two turns," as in driving in a screw—that is, the cord was twisted inwards. Mr. Page removed the testis and occluded the funicular process. The case did well. (The pathological specimen was exhibited at the meeting.) The enlargement shows that though the twist sufficed to prevent the return of venous blood it did not cut off the arterial supply. In my own preparation, however, although there was but a half-twist, it was so sharp as to arrest both the venous and the arterial flow, the epididymis and testis being, in comparison with those in Mr. Page's preparation, but little increased in size.

Twelve years ago Mr. Langton‡ reported a case of a somewhat similar, if not identical, nature. A painful tumour, of the size of an orange, suddenly appeared in the left scrotum. There had been no injury. "The cord is free and normal above the enlarged

* 'Brit. Med. Jour.,' April 15, 1892.

† The 'Lancet,' July 30, 1892.

‡ 'St. Barth. Hosp. Reports,' vol. xvii, p. 189.

testis." The tunica vaginalis (which was unusually extensive) was incised, and blood escaped. The epididymis was "almost black." "Its upper part presented a deep constriction as if twisted upon itself. An attempt was made to untwist it, but without success; for the appearance was as if the entire viscus had been twisted upon its own axis, and that blood had been rapidly effused into the epididymis, constituting, in fact, an apoplexy of this body." The testis and epididymis sloughed away, and the man left the hospital in the fifth week.

Mr. Gifford Nash* recorded a case which occurred in his own practice. A youth, 19 years of age, after a bout at boxing, sat down to tea. Soon afterwards he found that he had pain in his right testicle, and, as is usual in these cases, he vomited. Mr. Nash saw him within two hours after the appearance of the first symptoms, and found the testicle and the epididymis to be swollen and tender. They were in the normal scrotal situation, but the epididymis was anterior, and, as he could make out a tender knob or kink in the cord, he rightly thought that he had another instance of axial rotation of the testis to deal with. Without a cutting operation he promptly and smartly rotated the testicle inwards, leaving the epididymis posterior. At once pain ceased, the swelling began to subside, and the patient was relieved and happy. (It would be very interesting to know later whether the testicle received any permanent damage from this brief but serious disturbance of its nutrition.)

Mr. Barker† published a case of strangulation of the testicle. The subject was a boy, 15 years of age, whose right testis was small and undescended. He was also ruptured on that side. He had vomited. The case was regarded as one of strangulated omental hernia. On opening the tunica vaginalis, blood-clots escaped, and the swollen and livid testis was exposed. The cord was twisted three half-turns outwards. Mr. Barker removed the damaged organ, and the boy made an excellent recovery.

Dr. Fritz Cahen‡ has reported a case (with a coloured illustration) of a young man, 20 years of age, who had an undescended testis of the right side. When admitted into hospital it was found to be swollen to the size of a pigeon's egg, and was very

* 'Brit. Med. Jour.,' April 8, 1893.

† The 'Lancet,' April 8, 1893.

‡ 'Deutsche Zeitschrift für Chirurgie,' 1890, p. 101.

tender. It was thought to be an incarcerated hernia, but on the seventh day, when it was operated on, the testicle was found to be blackish-red, and the cord was twisted in two rotations inwards. The testicle was free in its sac and "like a plum on its stalk." It was removed, and the patient went home cured in fourteen days.

Gervais* has reported a "successful operation" in Mikulicz's Klinik for torsion of the spermatic cord in a boy of 4 years of age. The case, however, is so imperfectly recorded as to be practically valueless. The side affected is not noted.

Nicoladoni has described two cases.† The first was that of a forester, 16 years of age, who was suddenly attacked with pain and swelling in the right testis and with vomiting. The right side of the scrotum was empty. On an incision being made, bloody serum escaped, and a bluish-black and swollen testis was exposed. The cord was twisted outwards. The testis was removed. The second case was in a man, aged 62 years; the symptoms were similar to those already many times described; the twisted cord, which had almost made a complete revolution, was upon the right side. As gangrene seemed about to supervene, the testis was removed.

Bramann‡ has described a strange swelling of the left testicle, which he considered to be of a like nature with Nicoladoni's cases. The swelling was, however, less tender and acute, and, as in due course it subsided under cold-water bandages, there was no operation to confirm his diagnosis.

As regards the side affected, it would appear to be quite a matter of chance. Of the 14 cases here brought together the right side was involved in 8 instances and the left in 5. More important than this, however, is the fact that the twist is generally associated with imperfect descent of the testis and not seldom with a congenital hernia. I doubt whether a satisfactory explanation of the cause of the rotation of the testis will be forthcoming, though various theories may be advanced. The theory of misdirected energy of the gubernaculum is not altogether acceptable; for, even if the gubernaculum has all the power ascribed to it, it is difficult to see how, being fixed at its lower end, it can swing the testis round and round; and, as the rotation

* 'Medical Press,' May 11, 1892.

† Langenbeck's 'Archives of Clinical Surgery,' 1885, p. 180.

‡ Langenbeck's 'Archives of Clinical Surgery,' 1890, p. 163.

has sometimes occurred when the boy has been lying in bed, violent effort cannot always be the cause of the disaster. Boys about 16 years of age are, or should be, almost always at violent exercise, and it is at least suggestive that it is only the unhappy possessor of an undescended testicle that gets into this very peculiar kind of trouble. It is almost as if Nature herself, disappointed with her imperfect work, was anxious to cast it down a Tarpeian rock. There is one thing quite certain—namely, that a testis in the scrotum which possesses a normal mesorchium cannot be twisted. A scrotal testis with a long mesorchium may, perchance, undergo rotation, but this accident is far more likely to affect an undescended testis which has no mesorchium in the proper sense of the term. The direction of the twist taken by the revolving testis is entirely a matter of chance; it was sometimes inwards, sometimes outwards, and in some of the cases the direction is not recorded. Indeed, I see no imperative reason why it should be, though as a matter of interest the direction may well be noted. The condition of axial rotation of the testis is exactly like that of an ovary twisted on its pedicle, and I doubt whether the surgeon who is removing such an engorged ovary investigates the direction of the coil of the pedicle. In many instances of axial rotation of the testis it must be impossible for the surgeon to make the diagnosis before cutting down upon the swelling; but when the rotation has taken place so near to the testis—as in my own case—that the external abdominal ring may be found to be empty, the cord unobscured, and the vas deferens of normal size; when there is no history of kick or blow, and no discoloration of the skin; and, lastly, when there is a history of imperfect descent of the gland, when the epididymis is found in front of the testis, or when that half of the scrotum is empty—there need be no difficulty in making a correct diagnosis. In every case, however, the surgeon must confirm or effect his diagnosis by exposing the swelling, unless, indeed, he succeeds in untwisting the cord, as Mr. Nash so effectually did.

As regards treatment, the tunica vaginalis being opened, the tense, plum-coloured gland being exposed and the twist in the cord being detected, what should the surgeon do? The answer which I would give is, "Let him tie the cord high up and remove the swollen mass." And for these reasons: if, as is probably the case, the testis has never completed its descent, it is more than

likely that it is of no physiological value; but, even if it be perfectly developed, the chances are that the terrible engorgement to which it has been suddenly subjected would entail its subsequent atrophy, even if the gland escaped actual suppuration or gangrene. Twisting the spermatic cords in the lower animals is the French method of producing atrophy of the testes and sterility, and surely no other result can be expected after a tight twist of the cord in the human subject. Mr. Bryant is probably correct in his surmise that certain cases of atrophied testicle have been examples of axial rotation the nature of which had been originally overlooked. Seeing, therefore, that disappointment is almost inevitable in these cases if an attempt is made to save the gland after operating, that the risks of sloughing and septicæmia are not inconsiderable, and that, on the other hand, rapid recovery follows ablation of the darkened mass, there can be little advanced (except the sentimental reason) in favour of leaving the gland. The points to which it may be well that future observers should specially direct attention in cases of axial rotation appear to me to be these: (1) The relative position of the testis and epididymis; (2) the antecedent development, and the extent of the descent of the testis; (3) the association of a congenital hernia or of an open funicular process; and (4) the exact nature of the mesorchium, and, in the event of the testis being replaced, the subsequent progress of the case and the ultimate condition of the testis.

Mr. Bryant observed that as he had been one of the first to call attention to this subject, he was interested to find so many examples had been published since his own. The 14 examples brought before them by Mr. Owen were typical, and no fault could be found with any of them. He would not attempt an explanation of the mode in which the twist occurs, for, though he had often tried to find one, he had not succeeded in so doing. The fact that it occurred to young people in whom there was some sort of malformation of the genital organs was peculiarly interesting. In all but one of the cases recorded the affected testicle had either not fully descended or was associated with a congenital hernia; in fact, development was imperfect in one way or another. As to diagnosis, he thought that in the majority of cases the diagnosis of the true condition was quite possible, for although the general symptoms were to some extent those of hernia so far as sickness was concerned, it was rarely so severe or persistent, and, beyond the primary sickness, he doubted whether it could be said that there were any general symptoms of hernia at all. There was no persistent vomiting, no abdominal distension, nothing to suggest hernia beyond the appearance of an inguinal swelling. In his own case the vomiting was not lasting, the muscles of the abdomen were firm and rigid, and the abdomen was concave rather than convex. There was no distension, no abdominal pain outside the seat of the trouble. The local

symptoms were, however, usually severe, much more so than in the majority of cases of strangulated hernia. In his case the boy would not allow him to touch his scrotum or groin ; in fact, the local indications were out of all proportion to the general symptoms. When the swelling occupied the scrotum alone, and not the inguinal canal, and could be separated from the external inguinal ring, a hernia was clearly not present. When, however, it passed upwards to the internal inguinal ring there was a certain difficulty. When an impulse coexisted, the diagnosis of hernia might be made, but when no impulse was present the thought of axial rotation should arise. Locally also the swelling in axial rotation is more tense than is usually met with in hernia. As to treatment, he agreed that it was well to intervene early and to remove the testis in cases that had existed beyond two or three hours. In his own case he had left the testicle as there was no hernia, and he felt the testicle might recover itself. It was, moreover, the first case which had come under his knowledge.

Mr. Gifford Nash said that in the case of Whipple of Plymouth the nature of the swelling was different to any other, since it was hour-glass shaped, the lower half of the swelling being the testicle, while the upper half, which extended along the inguinal canal into the abdomen, was the swollen epididymis. This had more resemblance to a strangulated hernia than any other he had heard of. In this case severe vomiting, said to have been stercoraceous, occurred. In the second case in which he had been able to untwist the cord without operation, the boy, aged 19, had had no affection of his testicle before. The epididymis was situated in front of the testicle, there was a lump on the cord the size of a cobnut, and the testis and epididymis were swollen. He tried to untwist it to the left unsuccessfully ; he then repeated the manœuvre in the other direction, and in a few minutes the swelling of the testicle and epididymis had disappeared, and nothing was left but a little thickening at the site of the twist He proposed to make inquiries to ascertain whether, as suggested by the author, the testicle had subsequently atrophied. He had come across three or four more cases in addition to those which Mr. Owen had mentioned. There was one in 'Guy's Hospital Gazette' of gangrene of the testis. Three other cases had been recorded. The first, a case of Volkmann's, was recorded in the 'London Medical Record' for 1878, by Johnson Smith. It occurred in a boy of 18. The state of the testis and the epididymis was the same as in the cases related by Mr. Owen ; they were not removed, and a month later they necrosed and came away. On microscopical examination there were no signs whatever of inflammation, only dilatation of the blood-vessels. A case was recorded in Holmes' and Hulke's 'System of Surgery,' in which Mr. Howse had operated and removed a gangrenous testicle. No twist was noticed, but the state of the organs was such that he agreed with Mr. Bryant that it was probably one of the same nature. Mr. Howse thought it was "simply a gangrenous testis from strangulation, as a hernia might be strangulated." He also referred to another case in Erichsen's work on surgery, the patient recovering under leeches and the application of ice. With reference to the age at which this affection had occurred, he said it had been noticed between the ages of 14 and 23, except in the doubtful case recorded by Erichsen. That was the age of boyhood, the most active part of life, during which strains and twists were most likely to occur. Little, if any, difference was to be observed as to the side affected, the greater length of the left spermatic cord did not appear to make any difference. The twist of the cord had

occurred in the inguinal canal, at the external abdominal ring and outside it. There was much less chance of mistaking it for hernia if it occurred outside the abdominal ring. Out of nine cases, in six the testicle was incompletely descended, and in three there was congenital hernia. In his second case there was no abnormal condition of the testicle, and in Volkmann's case the testicle was said to have been previously healthy. He agreed with the author that removal was the only proper course to pursue, unless the twist could be undone without operation.

Mr. Richards suggested that there might be a congenital twist in the cord, but not sufficient to interfere with the circulation, and that some slight exertion or strain might cause an addition to the pre-existing twist, suddenly determining the characteristic symptoms of strangulation, leading to congestion and gangrene of the organ.

Mr. Owen, in reply, said he had noticed the case in Holmes' 'System of Surgery,' to which Mr. Nash had alluded, but he could not accept it as a case of axial rotation of the testicle. He admitted the possibility of a congenital beginning of rotation, for now and again one met with an epididymis in front of a testicle whilst examining patients, and it was quite possible that a subsequent further twist might convert the initial rotation into a complete twist, such as had formed the subject of his paper.

NEPHRECTOMY FOR HYDRONEPHROSIS.

By J. Bland Sutton.

The conditions of the kidney known as hydro- and pyo-nephrosis have, during the last 10 years, become of great interest to surgeons, and the methods of dealing with them have been so improved that nephrectomy for hydronephrosis has become as safe as an uncomplicated ovariotomy.

Having had several opportunities of operating upon some unusual cases of cystic kidneys, I thought it might be of interest to bring the matter under the notice of this Society, in order to demonstrate the comparative safety of nephrectomy for hydronephrosis when carried out on certain definite lines.

Before dealing with the purely surgical side of the subject it will be necessary to discuss some points connected with its pathology. That by far the greater number of hydronephroses are due to some easily demonstrable obstruction in the urethra, bladder, ureter, or pelvis of the kidney is indisputable; hence it is customary to describe a hydronephrosis as a *retention-cyst*. It is, however, important to bear in mind that hindrance to the free escape of urine must be either *incomplete*, or if *complete only temporary* to produce hydronephrosis. When the ureter is completely and permanently plugged the kidney rapidly atrophies. Experimental facts support the clinical evidence in this particular.

When the obstruction is partial, or temporarily complete and frequently recurs, its effect upon the renal pelvis is very striking.

The most startling fact a study of my cases and specimens brings out is this: Many of the largest hydronephroses are those in which no obstruction could be demonstrated, and the histories of the cases fail to throw any light upon the causes inducing the hydronephrosis. For a long time I felt that this apparent anomaly could be explained by abnormal movements of the kidneys producing kinks in the ureters; this explanation, though satisfactory occasionally, is in some cases totally inadmissible. It is also necessary to mention that the largest hydronephroses are usually those which are subject to intermission. All hydronephroses which form a tumour capable of being detected clinically intermit, but the phrase "intermitting hydronephrosis" is exclusively reserved for those cases in which great diminution, and in some instances temporary disappearance, of the swelling occurs. I once had an opportunity of actually witnessing the phenomenon of intermission whilst performing an abdominal section: the case is also of great interest, as the patient was the victim of bilateral hydronephrosis, and the cysts used to intermit alternately.

This woman, 42 years old, was placed under my care in 1890 on account of an abdominal tumour. On examining her I found a very large swelling on the left side and a smaller but very similar one on the right, furnishing the physical signs of renal tumours. Seven days later the patient was admitted into the hospital; at this time nothing abnormal could be made out in the right loin, but the left side of the belly was occupied by a large cyst reaching into the pelvis. The uterus was occupied by a myoma the size of a fist. A consultation was held upon the case, and the physicians present at the conference were inclined to regard the swelling as an ovarian cyst. To clear up the doubt I decided to explore the abdomen. In due course the patient was anæsthetised, and, whilst engaged in incising the belly-wall I saw the swelling gradually diminish in size, an alteration also noticed by the bystanders. On opening the peritoneal cavity the bladder was found distended with urine, and as it had been emptied by catheter just before the exhibition of ether, it was clear that the sudden diminution in the size of the tumour was due to the escape of urine from the enormously dilated pelvis of the left kidney. I took the opportunity to examine the right kidney, and it appeared natural in size and

consistence. The uterus was acutely retroflexed by a myoma, the size of a fist, in its fundus. The patient was so upset by the operation that further interference was for the time injudicious. The wound quickly cicatrised, and the patient left the hospital three weeks later (July 26). In 18 days she returned very ill, and in suffering with a very large tumour in the *right* loin, that in the left having subsided to such an extent that it was scarcely perceptible to the fingers on manipulation. On August 21 I exposed the right kidney through an incision in the loin, and evacuated 30 ozs. of thick pus, and then removed the remnant of the kidney in spite of the hydronephrotic condition of its companion. A rapid recovery was the consequence. I naturally felt anxious as to the subsequent fate of the left kidney.

The patient continued in excellent health for more than two years; she then began to experience difficulty in micturition at the menstrual period, and stated that the swelling in the left side was larger during menstruation, an observation which seemed confirmed by the fact that the uterine tumour had trebled its size since the patient first came under observation. The clinical evidence appeared to point so conclusively to the myoma being the source of trouble by pressing on the ureter, that I decided, after consulting with my colleagues, to anticipate the menopause by removing the ovaries. This measure was carried out. For about eight days the patient's condition was very promising indeed; then uræmic symptoms became prominent, and the temperature fell to 96°, and remained at this point in spite of active efforts to make it rise, and on the 12th day after the operation the woman died.

At the *post-mortem* examination the left kidney was found transformed into a large sac without any trace of renal tissue visible to the eye. The ureter was of normal size, and the uterine tumour had shrunk to the size of a fowl's egg.

These facts made it clear that the myoma was not responsible for the hydronephrosis, and the cause in this case remains unexplained.

In this unusual case, the fact that both kidneys were cystic enabled me at all times to satisfy myself of the existence of a tumour on one side or the other, notwithstanding the fact that both tumours intermitted, but the circumstance that the intermission was alternate simplified in a large measure the clinical

aspect of the case. When intermission occurs in a unilateral hydronephrosis, the occasional sudden disappearance of a tumour will often cause a great deal of perplexity in the mind of the observer. The following case will illustrate the diagnostic difficulties which sometimes arise:—

In 1890 a tall well-proportioned single woman, 26 years of age, was placed under my care for supposed ovarian disease. A careful examination under chloroform made it clear that the pelvic organs were healthy. Three months later the patient was again sent to me for the purpose of oöphorectomy. After keeping the case in bed for a week, and re-examining her, I made out some indefinite resistance in the right loin, and came to the conclusion that the trouble was more probably due to renal than to ovarian disease. Two years later I was informed that this woman had been in University College Hospital, where the Surgeon discovered a large renal swelling and had arranged to explore it, but a few hours before the time fixed for the operation the tumour vanished. Shortly after this the patient came to me again, and on examining her I made out a very large swelling in the right lumbar region. In August, 1892, she was admitted into the hospital, and at a consultation with the oldest and wisest of my colleagues, the most extraordinary opinions were expressed—one even doubted the existence of a tumour. I gained little by this conference, except an increased responsibility. To ease the doubts, the abdomen was opened in the middle line as for an ovariotomy. The right kidney was detected as a huge cyst: the ureter was traced into the pelvis, but I detected nothing abnormal in connection with it, the ovaries, tubes, uterus, or broad ligaments. The left kidney was natural. I closed the median incision, turned the patient into a lateral position, and removed the hydronephrosis, which had a capacity of nearly 100 ounces, through a wound in the loin. Recovery was rapid and complete.

Though the diagnostic exercise this cyst caused was great, yet I venture to suggest that the pathological difficulties are even greater, for there is no evidence of partially plugged ureter, or pressure on this duct from a pelvic tumour, and the connections of the cyst to the surrounding parts prevented rotation or any vertical excursions capable of temporarily obstructing the ureter, yet, in spite of this, the kidney became converted into an intermitting hydronephrosis.

An unusual example of unilateral hydronephrosis associated with great dilatation of the ureter is represented in Fig. 1. This specimen was taken after death from an old man. The closest examination of the ureter and bladder failed to detect an obstruction. During life there were no symptoms indicating renal disease, and the *post-mortem* examination was undertaken for the purpose of finding the cause of an inexplicable illness.

The silent way in which the gradual dilatation of the renal pelvis, infundibula, and calyces destroys a kidney is very extraordinary. When hydronephrosis is unilateral it rarely betrays itself until the tumour is very large; frequently the only trouble it causes is increased frequency of micturition.

When the hydronephrosis is bilateral the signs are often in abeyance until the amount of renal capital is reduced to the minimum amount capable of meeting the ordinary demands of the individual; directly there is an extra call, then the low amount of available renal tissue becomes alarmingly manifest, and the patient dies. The suddenness with which renal insolvency sometimes declares itself is evident in the following case:—

In June, 1893, a man of 26 years was placed under my care, under the supposition that he was suffering from acute intestinal obstruction. The patient was too ill to give a reliable account of himself, and his mother could tell us no more than that she found him very ill in his lodgings. The belly walls were rigid but not much distended; the flanks and loins were dull; the patient ejected a quantity of foul-smelling vomit, and had passed no urine for 18 hours; the bladder was not distended, and, so far as could be ascertained, there had been no action of the bowels for some days. The rectum was empty; pulse feeble and running; temperature 96°. I deemed it unwise to interfere with the case, but some of my colleagues thought the evidence so strongly indicated intestinal obstruction that he ought to be submitted to an exploratory incision. I grudgingly consented, and on making an incision in the left linea semilunaris came upon a large hydronephrosis. This was stitched to the wall and drained. The right kidney was in a similar condition. The man died 12 hours later. At the *post-mortem* examination, the kidneys were merely fibrous sacs, the hydronephrosis being due to a vesical calculus the size of a bantam's egg. From an inquiry made among the man's relatives, we found that he had never complained of any illness, and had

FIG. 1.—A hydronephrosis associated with great dilatation of the ureter. (Museum, Middlesex Hospital.)

continued to work until a few days before his admission to the hospital.

Although a hydronephrosis continues its course in silence it is almost certain to be made manifest when it suppurates, and my observations among the quick and the dead have taught me that this is one of the greatest dangers to which individuals with unilateral hydronephrosis are liable.

It is necessary to draw a distinction between pyonephrosis and suppurating hydronephrosis. In the case of a pyonephrosis the lesion is inflammatory from the outset, whether it start primarily in the kidney or spreads to this gland from the bladder, ureter, or elsewhere. A suppurating hydronephrosis is comparable to a suppurating ovarian cyst, requires similar treatment, and furnishes incomparably better results. A primary pyonephrosis

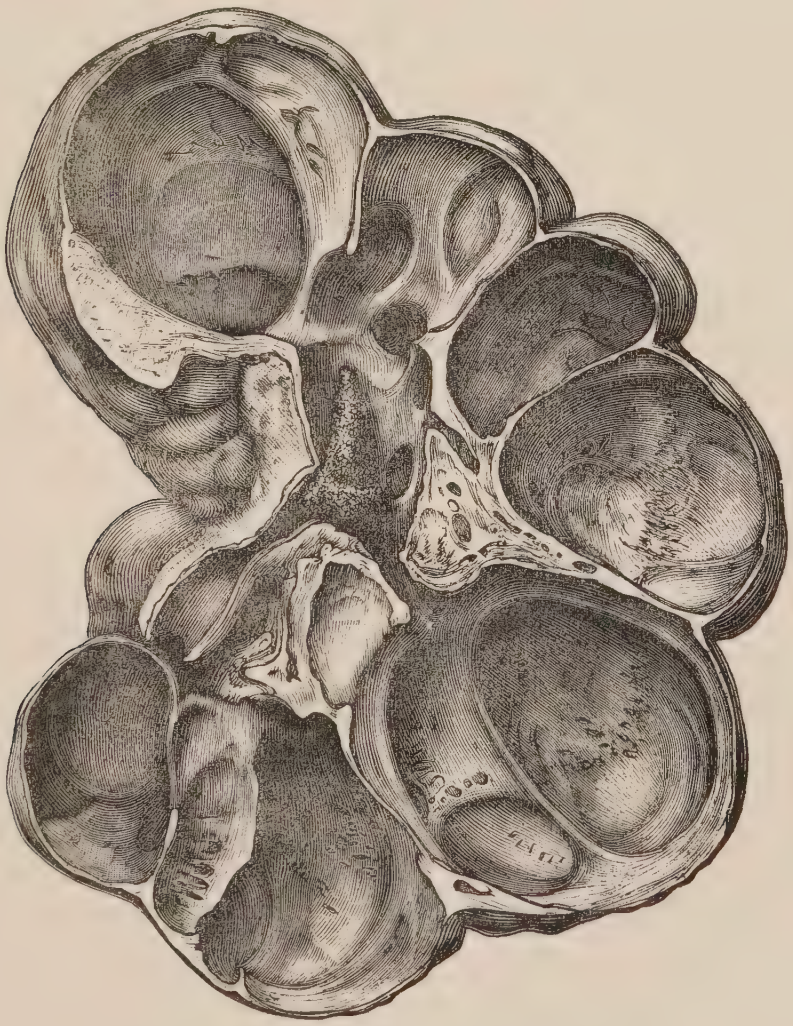


FIG. 2.—A suppurating hydronephrosis.
(Museum, Royal College of Surgeons.)

rarely attains a large size, and as it is very frequently associated with calculus it demands nephro-lithotomy or nephrotomy rather than nephrectomy.

An example of suppurating hydronephrosis associated with calculus is represented in Fig. 2. (It was successfully removed by Mr. Meredith.) The strait formed by the junction of the pelvis with the ureter lodges a peculiar hammer-shaped calculus; it is clear from its shape that it could not completely occlude the orifice of the ureter, but it would so hinder the free escape of urine as to produce hydronephrosis, which subsequently became a pyonephrosis. It, of course, does not necessarily follow that when a calculus is associated with a largely dilated pus-containing renal pelvis that the condition was primarily septic.

It is an interesting matter to inquire into the modes by which a hydronephrosis becomes septic. In very many cases there can be no doubt that the channel of infection is the ureter. The opinions formerly held that the healthy ureter allows no retrograde communication between bladder and renal pelvis is being gradually weakened; a dilated ureter certainly allows very free currents to pass from the bladder to the renal pelvis. There is, however, another source to be reckoned with—the colon. Whilst operating, I have satisfied myself that a large hydronephrosis comes into very intimate relation with the ascending or the descending colon, and the walls of the cyst and the gut sometimes become so blended and thin as to permit osmosis of fluid from the bowel into the hydronephrosis and establish suppuration. Under such conditions the patient's sufferings are apt to be confounded with typhoid fever, a confusion which sometimes arises in connection with the suppuration of an ovarian cyst. In the early part of 1893 I had a striking example of this in a young Frenchwoman, placed under my care by Dr. Beer. The patient had been treated many weeks, in a hospital in Brussels, for a supposed attack of typhoid fever, but at last she came in despair to some friends in England. Dr. Beer found a large swelling extending from the pelvis to the fifth rib on the left side; this swelling was dull front and back, but there was a marked bulging in the ilio-costal space. The patient had a hectic temperature, and the urine contained a slight trace of pus. Immediately on her admission to the hospital I made an incision into the left ilio-costal space, and evacuated three pints of pus. A large cystic mass could be made out in the

situation of the kidney, and through a small orifice on its posterior wall pus was leaking. On enlarging this aperture my finger entered a large sacculated kidney. Whilst my assistant was washing out the abscess cavity I gently enucleated the kidney from its capsule with my finger, tied the pedicle, and removed it. I have never seen a larger abscess cavity than was then exposed to view; the dome of the diaphragm formed a sort of apse at the upper end, and the ilio-psoas, ragged and torn, limited it below; the nerves of the lumbar plexus crossed the dorsal wall of the cavity like fiddle strings. The woman made an admirable recovery. Nothing was found to account for the dilatation of the kidney; the decending colon was incorporated in the inflammatory mass representing the renal capsule. In this case it is very probable that this woman had a hydronephrosis, which became fouled from the colon, and the signs consequent on the establishment of suppuration in the sac were misinterpreted. In due course pus leaked into the circum-renal tissue, and set up a perinephritic abscess of unusual dimensions.

Diagnosis.—The clinical recognition of a suppurating hydronephrosis is beset with far less difficulty than a simple hydronephrosis. The presence of a tumour in the loin accompanied by an elevated temperature and the escape of pus with the urine are well-known signs. A most important point in diagnosis is to distinguish between renal tuberculosis, pyonephrosis due primarily to calculus, and a suppurating hydronephrosis. Clinical experience enables us to do this with a fair amount of accuracy, and the differentiation is made rather by intuition, the offspring of experience, than by methods capable of being expressed in written rules.

Very large hydronephroses have been many times mistaken for ovarian cysts; also for pancreatic cysts, and tumours of the liver.

When of moderate size they are apt to be confounded with hydro- and pyo-cholecysts, scybala in the colon, omental tumours, hydatid cysts, hepatic tumours, and pedunculated processes of the liver.

In framing a diagnosis, never resort to what is called "aspiration for clinical purposes." This measure must be absolutely condemned, for it is useless, often misleads, and is sometimes the source of much danger. To thrust a trocar and cannula into an

abdominal cyst, or tumour of any kind, for diagnostic purposes, is bad practice; it is inadmissible in the case of ovarian cysts, and is equally reprehensible with renal tumours.

Treatment.—When a hydronephrosis is so large as to be clinically appreciable, it almost invariably causes the patient inconvenience, in a large number of cases is a source of much suffering, and in exceptional cases produces intense agony. The attacks of pain are probably due to variations in pressure of the fluid in the cyst, for, as has already been mentioned, almost all large hydronephroses intermit, more or less.

Another symptom, and one which is sometimes very distressing, is frequent micturition, unassociated with disease of the bladder or urethra. This sign is not so well appreciated as it should be. I have seen several cases in which female patients have had their bladders explored when complaining of frequent micturition, without effect, when a careful examination of the abdomen has led to the detection of cystic kidneys.

When the surgeon has satisfied himself that an individual has a large sacculated kidney, and the fellow gland is in good condition and working properly, the disorganised kidney should be removed, and especially if it has suppurated. When both kidneys are hydronephrotic, the removal of one may end in disaster. I have in the course of this paper, however, mentioned one case in which a suppurating hydronephrosis was successfully removed when the opposite kidney was known to be seriously disorganised. In the face of this grave complication, incision and drainage (nephrotomy) is the wiser course. In such cases it is well to remember that the power of secreting urine is of more importance to the individual than the capability of thinking.

Nephrectomy.—The method of removing hydronephrotic and pyonephrotic kidneys which has given me the most satisfactory results is the following:—

The peritoneal cavity is opened by an incision in the linea semilunaris and the nature of the tumour ascertained; through this incision it is a very simple proceeding to ascertain the condition of the opposite kidney. Exceptionally, where the diagnosis lies between an ovarian cyst or a hydronephrosis, I have made the exploratory incision in the middle line as for ovariotomy. If all is satisfactory the abdominal wound is closed, and the patient arranged in a lateral position, and the cyst exposed through an

incision in the ilio-costal space. No attempt is made to enucleate the tumour until the finger is well within the capsule; this is a cardinal point in the operation. It is due to ignorance of, or disregard to, this simple fact, that such accidents as tears in the peritoneum, colon, or diaphragm occur. When the cyst is well exposed it is tapped with a trocar and cannula, and its contents allowed to escape. The cyst wall is then gently enucleated and drawn through the opening in the loin. In the process of enucleation the large dilated ureter is often isolated; under these conditions it should be caught with forceps, transfixed, emptied of urine, and ligatured. When the cyst is freed from its parietal connections, the pedicle, consisting of renal artery, vein, nerves, and ureter, unless this has been separately secured, is transfixed and secured with silk ligatures, as in ovariotomy. The pedicle should be transfixed as close to the cyst as possible, especially when removing a right kidney. *Never clamp the pedicle with large forceps before securing the ligature.* The advantage of transfixing the pedicle near the kidney is due to the fact that instead of tying the short renal artery, the ligature embraces the numerous branches of the vessels into which it subdivides as it enters the sinus of the kidney. After securing the pedicle the ligatures are shortened, and the cyst cut away with scissors; any parietal vessels that may be bleeding are secured, a large drainage is inserted, and the wound closed by sutures. In closing the wound it is desirable to join the cut edges of the muscles, and especially the fascia, with buried gut sutures. The skin is brought together with superficial silk sutures in the usual manner.

Before suturing the wound the surgeon ascertains that *the number of sponges is correct.*

In this sketch of the method of performing nephrectomy through the ilio-costal space, and therefore behind the peritoneum, I followed closely the teaching of my surgical colleague, Mr. Henry Morris, who has done so much to advance the surgery of the kidney.* One of the most important points in performing nephrectomy by the lumbar route is, *never to begin to detach the*

* The removal of a hydronephrosis through the loin, and the converse plan of removing a solid renal tumour through the belly, aided by a preliminary incision in the loin, as described in 'The Clinical Journal,' November 1, 1893, p. 8, are so identified with the teaching of this surgeon that they should be spoken of as Morris' methods.

kidney until the finger is well within the capsule. Neglect this precaution then the operator is very liable to the following accidents: (1) to tear the peritoneum; (2) push the finger through the diaphragm, and open the pleural cavity; (3) to injure the colon.

In securing the pedicle it is advisable to keep close to the kidney; non-observance of this precaution in removing the right kidney has been accompanied by such serious accidents as: (1) transfixion of the inferior vena cava; (2) inclusion of a loop of the duodenum in the pedicle.

In securing the pedicle the ligature must be tied very tightly, as it is more liable to slip than the stump of an ovarian tumour. Such an accident is certain to entail loss of life if it happen after the patient is returned to bed.

Whilst applying the ligature do not drag on the kidney; when the parts are made tense, a glance at the patient's face will convince you that the interference with the solar plexus reduces the boundary between life and death to very slender proportions.

Convalescence may be interfered with by (1) suppression of urine; (2) hæmorrhage; (3) sloughing of the pedicle; (4) thrombosis of the vena cava; (5) fæcal fistula; (6) septic troubles; (7) sponges or plugs of cotton wool in the wound; (8) pleurisy.

Lastly, success in nephrectomy demands *decision*, *celerity*, and *gentleness*, qualities which can only be acquired by constant familiarity with renal operations.

One of the most important points in connection with hydronephrosis which requires elucidation is the fate of an individual who has been submitted to nephrectomy. At present, judging from the facts at my disposal, the outlook is very reassuring, but its satisfactory consideration must be delayed for a future occasion.

Mr. Alban Doran observed that there could be no doubt that nephrectomy for hydronephrosis was often justifiable. He would like to know the limits within which it should be undertaken. Two years ago he had under his own care two patients with hydronephrosis. One was 33 years old, and had been subject to a swelling in the right loin for three years; it began after a confinement. In October, 1891, a fluctuating tumour filled the right flank. The patient wanted it removed, because she could not attend to her domestic duties. But he found that it was a movable kidney, and the hydronephrotic condition disappeared on rest in bed. A suitable bandage was applied, and the hydronephrosis, due to obstruction of the ureter from the displacement of the kidney, never recurred. This was an example of the kind of case where operation was not justified.

Whenever the evidence was strong that the kidney was displaced, prolonged treatment by belts was called for, before the surgeon could make sure that the hydronephrosis could not be cured. In the second case, a woman aged 43, there had been a large fluctuating tumour, also of three years' duration. There was no evidence of displacement. Mr. Doran removed it in April, 1891, through Langenbuch's incision. The pedicle was easily secured, for the vessels and ureter were already obstructed. The ureter had adhered to an aberrant renal artery. Recovery was rapid. The specimen was exhibited ; it is now in the museum of St. Bartholomew's Hospital. ('Pathol. Ser.,' No. 2375*a*.) A similar specimen was to be seen in Guy's Hospital museum. When the cyst was filled after removal, the fluid only escaped when it was inverted, and the canal of the ureter was very narrow. Such a kidney could not have recovered. A considerable amount of kidney substance remained. He had not found that, as Mr. Sutton maintained, the glandular part of the kidney atrophied rapidly in hydronephrosis. Museum specimens seemed to show the contrary. On this important point turned the question of nephrotomy and drainage. Mr. Doran did not advocate the practice, he had known it to fail, nephrectomy being required after years of trouble from fistula. Yet if the surgeon could be fairly sure that the ureter was unobstructed, and found that the glandular part of the kidney was not absorbed by pressure, incision and drainage might, in some cases, cure a hydronephrotic kidney.

Mr. Henry Morris agreed that it was sometimes impossible to discover in the course of an operation, or *post mortem* examination, any cause for the hydronephrosis, but he did not think that in all such cases it was impossible to suggest a satisfactory cause. It was hardly reasonable to expect always to find the cause of an advanced hydronephrosis. Mobility of the kidney which had from time to time kinked or otherwise obstructed the ureter, might lead to obstruction and dilatation, and the organ become fixed in course of its enlargements, so that when one came to look for the case as a pathological entity it no longer existed. Often, too, there was a variation in the resisting power of different parts of the kidney, and the weak part yielded under slight intrarenal pressure. It was quite conceivable that a slight temporary obstruction might bulge the pelvis at one part, and that this pouch might completely obliterate the ureter by its weight very much as an aneurism sometimes obliterates the artery above or below it. They must also bear in mind that position, *e.g.*, keeping the recumbent position, might have much to do with the production of hydronephrosis, and he did not think one was justified in drawing the conclusion that a pelvic obstruction had not caused the hydronephrosis because there was no dilatation of the ureter in its whole length. It was commonly stated and believed—naturally enough at first sight—that after obstruction low down there must be dilatation of the ureter all the way to the kidney, as well as of the kidney itself. In taking that view, however, they forgot that many of these individuals who had causes of obstruction in the pelvis were invalids who largely resorted to the recumbent posture. In the horizontal posture some comparatively slight obstruction low down in the ureter would be sufficient to keep that tube full without dilating it, and the portion of the duct which was the weakest would yield. It did not follow that the obstruction had not been low down in its course simply because the ureter was not dilated in its whole length. Any part of the urinary system from Malpighian capsules to external urinary meatus might be the seat of

obstruction. Just as dilatation of the Malpighian capsules develope into cysts, so from tubular obstruction dilatation of many tubes might take place, and then subsequently coalescing, form the beginning of a vast hydronephrosis. One must bear in mind the great variety of the forms of hydronephrosis. Two forms in particular, very different, come under the notice of operating surgeons. He referred on the one hand to the large thin-walled cysts in which scarcely any renal tissue remained, and what was left was spread out over the cyst; these cysts, if tapped in the course of an operation, were completely emptied. The other class of cases were those in which in addition to dilatation of the kidney they had a large amount of thickened and hypertrophied cortical substance, kidneys in which, when laid open, the calcyes were seen to be very much dilated and separated from each other by dense, tough fibrous septa. This condition was especially apt to be met with when, in consequence of the functional disuse of one kidney, the other had undergone compensatory hypertrophy before it, in its turn, became dilated, atrophy and dilatation thus proceeding *pari passu*. It often happened that uræmic symptoms occurred after nephrectomy or after pathological destruction of one kidney in consequence of the complete blockage of the remaining kidney. He had several times been able to rescue patients from impending death from uræmia by performing nephrotomy on the remaining kidney and establishing a communication through the loin. These cases of very hypertrophied cortex with hydronephrosis might be (though rarely) the subjects of nephrectomy, and would have to be removed in the same way as a solid tumour, viz., after separating adhesions posteriorly through an ilio-costal incision, completing the operation through an anterior incision in the linea semilunaris. Nephrectomy for this form of dilated and hypertrophied kidney would be much more like a nephrectomy for a solid tumour than for a typical hydronephrotic kidney which collapsed on the evacuation of its contents. He asked the author whether his remark as to the necessity of getting the finger well within the capsule before attempting enucleation applied to the thin-walled cysts. His own impression was that the surgeon ought to get well down on to the capsule before beginning to separate; but only when there were great adhesion and inflammatory thickening outside the capsule ought the capsule itself to be left behind. In the hydronephrotic cysts it was not possible to get inside the true renal capsule without getting into the cyst itself. In such cases they must take care to get well down to the fibrous capsule of the kidney and remove the cyst as completely as possible, as one would do an ovarian cystoma or a cystic tumour elsewhere in the body.

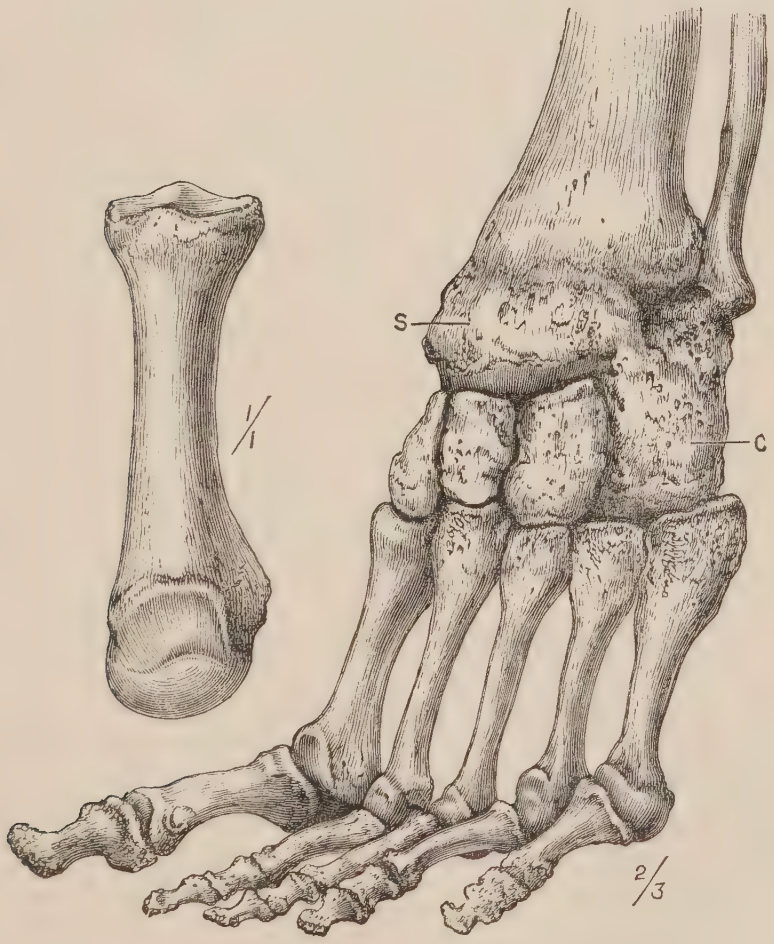
Mr. Bland Sutton, in reply, urged that the opinion expressed by Mr. Morris, that pressure on the ureter in the bony pelvis would sometimes lead to dilatation of the renal pelvis without dilating the ureter, was very important, and he would look into the matter as opportunities arose, to ascertain what evidence could be adduced to support it. Mr. Sutton admitted that in some cases of pyonephrosis the condition of the kidney was such as to render its removal through the ilio-costal space impossible, and it could only be dealt with as a solid tumour and removed through the anterior abdominal wall. The chief purport of the paper was to demonstrate the safety of lumbar (extra-peritoneal) nephrectomy in cases of simple and suppurating hydronephrosis, and especially those very large specimens of hydronephrosis which are apt to be confounded with ovarian and parovarian cysts.

December 11*th*, 1893.

SPECIMEN OF LEG AFTER MIKULICZ'S OPERATION.

By J. Bland Sutton, F.R.C.S.

Mr. Bland Sutton exhibited the skeleton of a leg three years after the performance of Mikulicz's Operation. The patient, a girl 18 years of age, had been lame since infancy, on account of infantile paralysis, and in June, 1890, Sir William MacCormac endeavoured to make the defective leg effective by producing an artificial pes equinus, according to the plan laid down by Mikulicz. An examination of the specimen (see Fig.) showed that the inten-



tion of the surgeon had been anatomically fulfilled, the freshened surfaces of the scaphoid and cuboid having become firmly ankylosed

to the cut surfaces of the tibia and fibula. The disposition of the toes was interesting, for instead of lying in the same plane as the metatarsals, they were at right angles to them, and the first phalanges had fashioned for themselves new articular facets on the dorsal aspects of the heads of the metatarsals. In order to render this clear in the drawing the first metatarsal is sketched separately, and of natural size. In spite of the success of the operation, the foot was of little service in progression, as it caused the girl much pain and inconvenience, and the skill of the surgical mechanician being unavailing, Mr. Sutton removed the leg in September last, by amputating through the knee-joint. The specimen, as far as he was aware, was the only skeleton of a leg after Mikulicz's operation existing in London.

Mr. Keetley said there were cases in which the heel and waist of the foot were too much damaged for a Mikulicz's operation, and in which an ordinary leg amputation could be avoided by utilising the sound skin and other soft tissue of the anterior part of the foot, preferably of the sole, to cover the tibia sawn across at the mallcoli. To preserve the nutrition of such a flap a bridge of flesh containing either the planton vessels and nerves or the dorsalis pedis was necessary, but this bridge or pedicle need include no skin. He showed an illustrative case, in which the operation had now been done nearly six years, and in which the stump bore pressure as well as any "Syme," and, indeed, had the appearance of one. The redundant tissue of the pedicle had wasted away.

In this operation the nerves supplying the skin of the pressure-bearing parts had not to be divided, an advantage over Mikulicz-Wladimiroff's, because all would agree that sound innervation of any substitute for a foot was desirable.

A FIRST SERIES OF FIFTY OVARIOTOMIES: A PLEA FOR THE PERFORMANCE OF OVARIOTOMY BY OBSTETRIC PHYSICIANS.

By Herbert R. Spencer, M.D., B.S. Lond., M.R.C.P.

The publication of a series of cases of ovariotomy at the present day would seem to need some apology. I have three reasons for writing this paper. The first is that I consider it a useful custom for everyone who performs ovariotomy to publish complete lists of his cases, with dates and other means of identification, and with a statement (sufficiently detailed in the fatal cases) of the other abdominal sections which he has performed during the period to which his lists refer.

The second reason is that, in the series of cases hitherto published, there has usually been a noteworthy absence of reference to such important points as the number of cases in which the wound failed to unite by the first intention, or in which stitch-hole abscess occurred, the number of cases in which sinuses existed when the patient was discharged, or in which ligatures came away subsequently, hernia at the site of the scar, and the after-history of the cases. In this connection also I would point out that, while it is often stated that an operation has been performed with antiseptic, with aseptic, or with no special precautions, it has rarely been stated what are the actual precautions which have been taken. Upon these points I have given information in the present paper.

My third and my chief reason for writing this paper is that I think the time has arrived when the obstetric physicians in London, the men who do the bulk of the teaching of gynæcology should by their publications show that the operation of ovariotomy when performed by themselves, is at least as safe in a general as in a special hospital. To University College Hospital, where ovariotomy has been performed by the obstetric physicians for 28 years, the obstetric physicians of London owe a debt of gratitude, for it is mainly due to the success of my master, Dr. John Williams, that the practice of allowing obstetricians to operate has spread to other general hospitals. In carrying on the tradition of my predecessor I shall be more than satisfied if this small communication of mine has any influence in bringing about a further extension of the generosity of our surgical colleagues, namely, the entire giving over of operations on the uterus and ovaries to the obstetric physicians of our medical schools.

Such being the object of my paper I have not thought it necessary to encumber it with minute particulars of the operation in the individual cases, the methods of removing tumours of the ovary and broad ligament being now sufficiently well known. But I have given such particulars of the cases as show the nature and approximate size and difficulty of removal of the tumours, regretting that the absence of facilities for weighing the patient immediately before and after the operation has prevented me from giving the exact weights of the tumours. Many of the cases have great clinical and operative interest, an account of which I hope to publish on a future occasion. For the method of operating I lay

no claim to merit; I have followed in the footsteps of Dr. John Williams, to whom I owe what I know of ovariotomy. If modesty would permit me to make a personal claim, it would be that I have been *careful*, and have exercised the closest personal supervision and scrutiny in every case.

To the resident obstetric assistants who have helped me at the operation, I wish to convey my thanks for the zeal and enthusiasm and conscientiousness with which they have carried out their duties.

In addition to the publication of a list of cases upon which he has operated, it is desirable that an operator should state whether any cases have come under his care upon which he has *not* operated. Two patients with simple ovarian tumours, in spite of my urgent advice and entreaties, obstinately refused to be operated upon: with these exceptions I am able to state that I have operated upon every case in which I have diagnosed ovarian tumour and it has not been malignant, however unpromising the case might be, without an eye to statistical results and without any selection of cases. This is I know not the universal custom, even with operators of established reputation; but statistics where there is any selection of cases do not give the true results of the operation.

Neither have I tapped any case, though six cases had been aspirated by other practitioners (not necessarily those given in the table) before they came into the hospital. The tapping of ovarian cysts, unless they are undoubtedly malignant or unless the patient is suffering very acutely from some pulmonary affection or grave general disease independent of the tumour, is, in my opinion, an unjustifiable procedure. Besides the danger of hæmorrhage and sepsis there is the risk of disseminating papilloma and malignant disease, the impossibility of removing the contents in some cases, and the certainty of not curing the patient. Except under the rare circumstances mentioned above I object wholly to tapping, even as a preliminary to operation, while when performed as a *substitute* for operation, it is clear that the operator has more consideration for his own statistics than for his patients' welfare. I have seen operations which otherwise would have been perfectly simple converted into the most terrible by the adhesions set up by peritonitis following tapping, and ovariotomy would, in skilled hands at the present day, be almost free from danger if practitioners would

devote attention to the early diagnosis of these tumours and would abstain from this dangerous practice of tapping. Had I refused to operate on any case, or sent it away "relieved" by aspiration I might have avoided some difficult operations; but I should also have missed the satisfaction of saving some apparently almost hopeless cases, the recovery of which has given me more gratification than any other event in my medical career. When the diagnosis of non-malignant ovarian tumour has been made I have always advised operation, and my experience of dangerous cases, such as ruptured, suppurating, and septic cysts, has led me to the conclusion that the worse the condition of the patient the more urgently necessary is prompt operation. Then I wish to say something about "incomplete ovariotomy." This is a dark corner in which many unsuccessful operations have been buried, and I think nearly every operator of repute has made a little list of these incomplete operations which are not counted in his statistics of "ovariotomy." It will be found that the mortality of these cases is high. There is to be said in favour of the division into "ovariotomy" and "incomplete ovariotomy" that, inasmuch as an incomplete operation may be in its immediate result comparatively safe—though in cases of ovarian tumour it is almost always ultimately fatal—the inclusion of such incomplete cases in a list of ovariotomies might put the unskilful operator on a level with the skilful one as far as statistics of immediate mortality are concerned.* But the number of incomplete operations will be an index of the skill of the operator quite as much as his immediate mortality; on the other hand, the exclusion of incomplete operations from lists of ovariotomies enables a dishonest operator to say in an adherent fatal case that he did not remove the whole tumour, "a bit was left behind," the operation was "incomplete," and so his ovariotomy record is kept up: this exclusion of incomplete cases has even been used to explain away a death on the table before the operation was finished. What a patient who has an ovarian tumour wants to know is the risk she runs in having the tumour removed: this information can only be obtained from tables in which complete and incomplete cases are included, and I am strongly of opinion that in lists of ovariotomy every case should be given in which

* See, for instance, the cases of Omori and Ikeda ('Centralbl. für Gynæk.,' 1892, s. 1009). In addition to the 5 deaths there were 14 incomplete operations, that is to say, 19 *non-successes* out of 100 cases.

an attempt has been made to remove the tumour. For my part I have not had an incomplete operation in a case of ovarian tumour, but in cases of broad ligament cysts there were two in which I did not completely remove the most deeply imbedded portion of the cyst: they both healed and recovered. Case 8 I should now be able to remove; Case 6 on account of burrowing around the uterus could not have been completely removed without hysterectomy; operation had been refused in one special and two general hospitals; she also healed and was well as regards the operation three years later.

Another important point about which most operators are silent is the number of cases in which union takes place by first intention and the number of stitch-hole abscesses which occur. With the exception of the site of the drainage tube which usually does not immediately heal, *primary union* without any suppuration took place in 47 cases: in the three others it also apparently occurred, but there was subsequently some suppuration. In Case 2 an abscess in the lowest stitch-hole due, I believe, to infection in removing the stitches, led to the formation of an abscess containing about 2 ounces of pus. After this had been opened the little cavity rapidly closed. It was the only stitch-hole abscess I had in the whole 50 cases.

In the second case (24) the tumour was suppurating, and the pus burrowing in the abdominal wall at the time of operation; a little pus subsequently collected behind the lower end of the wound: after it had been evacuated the cavity gradually closed.

In Case 38 the whole superficial part of the wound broke down and subsequently granulated up. It is interesting to note that in the same patient, after the removal of a small fatty tumour from the dorsum of the foot, the wound took nearly two months to heal; yet I think the suppuration must have been due to inoculation of the wound. The fact that in only three cases has there been stitch-hole abscess or suppuration has led me to formulate this opinion: unless there is sepsis at the time of operation, stitch-hole abscess or suppuration of the wound is the fault of the operator.

I have further to add that every case has been discharged with the wound soundly healed and free from sinus, and I have never known a pedicle ligature come away after operation. These accidents are, I believe, usually due to infection of the ligature either

before or during the operation, and to the too frequent use of the drainage tube.

In no case has a hæmatocele developed in the broad ligament after the operation. I think this accident must be due to careless tying of the ligature or to the employment of an unreliable or fancy knot.

After these introductory remarks I now proceed to an analysis of the cases as given in the table. Of the 50 cases, 44 were operated upon in University College Hospital, and 6 were private patients, and were treated in a nursing home. The private cases are indicated in the table by a single initial letter.

The *age of the patient* was from			10	to	20	in 2 cases.
,,	,,	,,	20	,,	30	,, 13 ,,
,,	,,	,,	30	,,	40	,, 12 ,,
,,	,,	,,	40	,,	50	,, 11 ,,
,,	,,	,,	50	,,	60	,, 7 ,,
,,	,,	,,	60	,,	70	,, 4 ,,
,,	,,	,,	70	,,	80	,, 0 ,,
,,	,,	,,	80	,,	90	,, 1 ,,

This heading calls for no special remarks, except that Case 46 was, at the time of operation, over $82\frac{1}{4}$ years old, having been born on September 8, 1810.

She is, as far as I know, the oldest patient upon whom ovariotomy has been performed, with the exception of Dr. Homans's case,* which was apparently a few weeks older. Although she only wore an abdominal belt for about six weeks after getting up, she has now a firm linear scar without the slightest tendency to hernia, and I saw her on November 1, 1893, in very good health for her age.

Thirty-six of the patients were married, 7 of these being nulliparous; 14 were single women. In all cases I have observed the time occupied from the commencement of the abdominal incision until the dressing was applied. In 8 of these cases I neglected to record the observation at the time. Most of these 8 operations lasted about half an hour, and none lasted an hour. In the 42 cases in which the time is noted the operation lasted from

* 'Boston Med. and Surg. Journal,' 1888.

10 to 20	minutes	in	4	cases.
20 „ 30	„	„	12	„
30 „ 40	„	„	8	„
40 „ 50	„	„	8	„
50 „ 60	„	„	4	„
Over 1 hour		„	6	„ (of the whole 50).

The longest duration was 80 minutes.

I think it most desirable that operators should publish the length of time occupied by their operations. I am of opinion that any time spent beyond three-quarters of an hour adds appreciably to the danger of an operation. Yet I hear of operators taking as long as two and a half or even three hours over an adherent case. My own practice is in favour of rapid removal of the tumour, but of spending sufficient time in cleansing the peritoneum, ligating the pedicle, and accurately suturing the wound. Of the 50 cases, in 15 the tumour was on the right side, in 22 on the left, and in 13 on both sides.

In 33 cases there were adhesions, often very extensive and strong (see table). The cases which had been previously tapped were very adherent with one exception (12); in this there were 20 pints of fluid in the peritoneum, and nearly 5 in the left pleura. *Drainage* was employed in 11 cases; of these, 5 were broad ligament cysts; in Case 32 the abdominal wall only was drained. The peritoneal sac was drained in 5 instances only; amongst these the fatal case occurred. In this case (16) the Keith's drainage tube slipped into the abdomen, an accident which has led me to use a glass drainage tube with two large flanges, which render such an accident impossible. I believe that several of these 5 cases would have done equally well without the tube, and that drainage is resorted to far too frequently by some operators.

Flushing the peritoneal cavity has not been employed in any case: I regard it as unnecessary and even dangerous, and it seems to frequently require the subsequent use of the drainage tube. I would restrict it almost entirely to cases of encysted septic or purulent fluid.

The temperature has been taken for 5 minutes in the rectum, and for 15 minutes in the axilla, every 4 hours by day and by night, and I have no trust in charts where it is taken less frequently. It would be useful if operators would agree to the four-hour record, and would state whether it is taken in the rectum, axilla, or

mouth. On the whole, I think the axillary temperature is most convenient, but the rectal most trustworthy. The rectal temperature is, however, higher by about 1°, and sometimes 2° or 3° higher than the axillary. In the table I have stated the highest temperature recorded in the first seven days after the operation: this gives a less favourable and less valuable record than the average temperature; but I intend to treat the question of temperature after ovariotomy more fully elsewhere, and have not thought that for the purpose of this paper the result of getting the mere average temperature during the whole week was commensurate with the labour involved.

In 15 cases the temperature is rectal, and in 35 axillary. The average highest rectal four-hour temperature during the first week was 101·2°, and similarly the average highest axillary temperature was 100·4°. The highest temperature recorded—103·4° (rectal)—occurred in the fatal case just before death.

Of the whole series but one died (Case 16). This patient had a suppurating ovarian dermoid of the size of an infant's head, extremely adherent to the surrounding parts. She had also extensive ulceration of the rectum and descending colon; in one place the gut was reduced by this ulceration to its peritoneal coat. The drainage tube (Keith's) slipped, or was pushed into the abdomen by the patient on the second day, but was easily withdrawn by forceps. She was greatly collapsed after the operation, which was very difficult, and she died with symptoms of exhaustion (probably due to sepsis) in 53 hours. There were 3 or 4 ounces of clotted blood and bloody fluid in the pelvis which had oozed from torn adhesions. Coils of intestine were adherent to each other round the drainage tube and the effused fluid. There seemed to be commencing inflammation of the general peritoneum, but this was not marked. The gut had not been injured by the drainage tube. I think infection of the effused fluid took place through the wall of the rectum and colon, which were extensively ulcerated.

The remaining 49 cases recovered, and were discharged well, with the wound completely healed and free from sinus or suppuration.

The patients usually got up at the end of three weeks, and were discharged about the fourth week, but when any complication arose they were detained until they had completely recovered.

Of the 50 cases, 32 were tumours of the ovary, of which 5 were dermoids; 8 were tumours of the broad ligament or parovarium, 1 of these was malignant, of enormous size, weighing about 70 lbs., and was treated by enucleation and hysterectomy.

Five of the tumours were suppurating (16, 24, 32, 37, 47); several others had puriform contents, which the microscope showed not to be pus. In all (with perhaps the exception of Case 16) the suppuration followed labour, and was probably occasioned by infection at that time. 1 case was 3 months pregnant at the time of operation: she went to term, and was safely delivered of twins; 8 cases were observed at or soon after labour; 6 tumours had been previously tapped, and 7 had a twisted pedicle; 2 of the cysts had recently ruptured.

In the last column of the table I give later information of the patients as to their being alive and free from hernia. I have been able to get information concerning 48 patients, and it will be seen that hernia at the site of the scar has occurred in 4 cases. The ages of these patients were 66, 58, 64, 41, thus all, except the last, were somewhat advanced in years. The last was a very bad case of suppurating cyst which had been tapped, and the trocar left in the cyst three weeks. None of the patients suffer any pain or discomfort from the hernia, but its presence undoubtedly is a source of danger, and I should be glad to adopt any method of treatment which would prevent its occurrence. Reliable statistics upon this important subject are much needed; but the records to be of any value must be given with dates, for, until I undertook the preparation of this paper, I was only aware that hernia had occurred in one of my own cases.

I may add to the information contained in the last column of the table that Case 4 died after operation for intestinal obstruction produced by a peritoneal band about 15 months after the ovariotomy, and Case 20 succumbed to peritoneal and pelvic cancer in about 14 months. Concerning two of the cases, I can get no information, as their address is unknown. I have no reason to believe they are otherwise than alive and well.

The Method of Operating.—The operations have been performed in a private room at University College Hospital or at a nursing home. The room is usually "sulphured," and occasionally limewashed between the operations. In the hospital cases the patient was moved down two flights of stairs and through four wards into

the general ward, in the earlier cases on the seventh day, in the later cases on the third or fourth day. The slight excitement of this journey sometimes caused a temporary rise of temperature. The operation was done under strict Listerian precautions, including the spray. Although I have now abandoned the spray as unnecessary and inconvenient, I think the result of this series of operations shows that its employment is not followed by any serious consequences.

The patient is prepared by aperients followed by enemata on the two nights preceding the operation. The skin is washed, and a towel soaked in 1 in 20 carbolic acid is placed on the abdomen for three hours before the operation. The operator's and assistants' hands and forearms are washed and scrubbed with soap after soaking in solution of iodine (liquor iodi two drachms to the pint); they are then immersed in 1 in 20 carbolic acid for about two minutes.

The *sponges* (10 in number) are prepared by beating and washing and soaking for successive periods of 12 hours in the following solutions:—25 per cent. hydrochloric acid, 5 per cent. sulphurous acid, 1 in 500 corrosive sublimate. They are then placed in 1 in 20 carbolic acid, in which they are kept for at least a week until the operation, when they are put into 1 in 40 carbolic acid. They are always counted by myself before and after the operation.

The *instruments* (made entirely of metal) are carefully cleaned and brushed after the operation, and before the operation they are boiled for an hour in 1 in 20 carbolic acid, in which they are placed during the operation.

Floss silk of moderate thickness is used for the pedicle and abdominal wound. It is prepared by boiling for three hours in 1 in 20 carbolic acid, and then placed for 12 hours in 1 in 500 corrosive sublimate, then in 1 in 20 carbolic acid, where it remains for at least a week before it is used. Thus prepared it is absolutely safe as regards sepsis. No patient has gone away with a sinus, nor has a ligature ever come away. I prefer floss silk to "Chinese twist," because it is cleaner, of more open texture, less liable to be damaged by manufacture, and can be drawn tighter. In case of broad or thick pedicle the first knot is seized with forceps; "Chinese twist" is then apt to snap. The pedicle is tied in two halves and then as a whole with a reef-knot as tight as possible.

To pass the pedicle ligature I use a short straight round needle made of "delta" metal; it is much more convenient than the handled needle, is safer, saves time, and does not rust. If the raw surface of the pedicle is extensive I sometimes stitch it over with fine silk, and tie any prominent vessels. Adhesions requiring ligature are tied with fine silk, in the earlier cases with carbolised catgut.

The wound is sewed up by passing the thick silk through all the layers of the abdominal wall, and the skin is accurately apposed by fine silk. The wound is dressed with Lister's carbolic gauze (or sometimes with iodoform gauze), kept in place by a many-tailed flannel bandage.

The After-treatment :—

Nothing is given by the mouth for 24 hours, or where vomiting persists for 36 hours or more; on the second day barley-water with milk and Gerrard's peptones in small quantities; no solid food for the first week. In some cases milk disagrees and causes vomiting: for these rectal feeding with peptones is employed. No morphia is given except for prolonged sleeplessness; it is rarely required and better avoided. Rarely is alcohol administered. The bowels are opened by aperient and enema on the eighth day, when the sutures are removed and strapping applied. The urine is drawn off (when necessary) every six hours by rubber catheter kept in 1 in 2000 sublimate solution. In persistent vomiting and distension, which rarely occur, the bandage is removed, a copious enema is given, and the abdomen *massaged*. I have never reopened the abdomen.

The patient lies as much as possible on the back for the first week, does not sit up for three weeks, gets up two or three days later, and is discharged usually at the end of the month, wearing an abdominal belt which she is instructed to use for at least a year.

Other Abdominal Sections.—During the period over which these 50 ovariotomies extend I have also performed 18 abdominal sections other than ovariotomies, of which two died. One of these was a case of rupture of the uterus from neglected shoulder presentation; she was moribund from shock and hæmorrhage, and died in a few minutes, before the operation was completed. The other was a case of exploratory operation from malignant disease of the ovary and peritoneum. Finding secondary growths in the

omentum and peritoneum, I closed the wound without removing anything. The patient recovered well, and the wound healed by first intention. On the twelfth day, when she was apparently quite well, she suddenly died of pulmonary embolism, the clot having come from a sacculus in the iliac vein as shown by the autopsy. The remaining 16 cases recovered. I append a table of these 18 cases.

Disease.	Number of Cases.	Recovered.	Died.
For hydrosalpinx	2	2	
„ pyosalpinx	1	1	
„ tubal mole	1	1	
„ pelvic abscess	4	4	
„ hernia after hysterectomy	1	1	
ruptured uterus	1	..	1 (on the table)
Oöphorectomy for fibroids	1	1	
Cæsarian section (Porro) for fibroids obstructing labour	1	1 (also child)	
Abdominal hysterectomy for fibroids	2	2	
Exploratory for malignant ovarian	1	..	1 (embolism)
„ „ fibroid of abdominal wall	1	1	
„ „ abscess in broad ligament (opened per vaginam)	1	1	
Exploratory for retroperitoneal sarcoma.	1	1	
Total	18	16	2

These 68 operations constitute the whole of the abdominal sections I have performed up to April 15, 1893.

I now proceed to consider the cases of ovariotomy as bearing upon the question—"Who should perform ovariotomy in the general hospitals?"

The present first series of 50 ovariotomies (with one death) is, as far as I know, the most successful of such series which has yet been published. I am very far from desirous of claiming for this result any personal credit, which belongs to my predecessor, whose methods I have followed. But I think the result is a justification of the system—adopted for 28 years at University College Hospital, and of late years at most of the other general hospitals in London—of allowing the obstetric physicians to perform ovariotomy. But a few years ago it was thought to be highly dangerous to perform the operation in a general hospital, and at University College

Hospital until 1884 the operation used to be done in a neighbouring house; since that date it has always been performed within the walls of the hospital. I think the present series of cases shows that, when performed by a specialist, ovariotomy is at least as successful in a general as in a special hospital. There was at one time a danger that major gynæcological operations would disappear from our great medical schools. This danger is now past, but there are still some who assert that obstetric physicians should not perform operations, or, at least, not abdominal sections, or only those abdominal sections which are of obstetric importance, such as Cæsarian section. Now it is quite impossible to carry on an obstetrical or gynæcological practice without operating; an obstetric physician may limit his operations, but he cannot exclude them, and there seems to be no reason why he should be allowed to remove a uterus by vaginal and not by abdominal section (the former being more difficult than and often quite as dangerous as the other), no reason why the field of his operative activity should be limited by the plane of the pelvic brim. And it does appear to be as illogical as it is to the patient unfair to allow Cæsarian section—the greatest of all operations, and, when complicated with tumours, one of the most difficult and dangerous—to be performed by an obstetric physician who is not allowed to remove a simple ovarian cyst.

It is often said that the operation ought to be done in general hospitals by general surgeons and not by obstetric physicians. Against this view it may be urged that, supposing all the surgeons of a general hospital do the operation, and that one or more have not a tendency towards gynæcological specialism (for which their clinical opportunities afford no justification), then each surgeon would get but three or four ovariotomies annually at the present rate of admittance, and it is generally acknowledged that extensive experience is more necessary in abdominal than almost any other kind of surgery. With such a system patients would cease to come, and doctors would cease to send them to these inexperienced general surgeons, and the cases would go to the special hospitals and be lost to the medical schools.

Neither does the system of allotting the ovariotomies to one surgeon for a short term of years meet the requirements of the case, for the services of the surgeon are lost at the time when they have become most valuable.

At some schools it is the custom for both surgeons and obstetric physicians to do these operations. Where this practice has had a fair trial it is found that the great bulk of the cases go to the obstetric physicians.

I have heard the opinion expressed by surgeons who admit that obstetricians should operate, that surgeons should occasionally perform a simple ovariotomy to "keep their hand in," the obscurer and difficult cases going to the obstetric physician. Such an arrangement is obviously unfair to the obstetric physician, and puts him at a disadvantage when compared with the gynæcologist at a special hospital.

The system which most conduces to the interests of the medical schools is undoubtedly either that which puts the operation in the hands of one surgeon for a long term of years, or that which gives it over entirely to the obstetric physicians.

I am not one of those who think that there is any mystery about ovariotomy, or that a well-equipped surgeon cannot perform the operation well. But what I maintain is that he cannot perform it *so* well as one who devotes his whole time to the study of this and allied subjects and keeps himself abreast of the latest advances in gynæcological pathology and treatment, who is daily examining the pelvic organs of women, and who, from the nature of his practice, has acquired skill in diagnosing pregnancy and disease such as no general surgeon has the opportunities of obtaining. In endeavouring to arrive at a right judgment in this matter there are two considerations of prime importance. The first is the welfare of the patients; the second is the teaching of students and the advancement of medical knowledge. How far the welfare of the patient is affected by the operator being an obstetric physician I offer the present paper as evidence, and regret that few general surgeons have similarly published all their cases. Were this done I believe the question would be at once settled, if not by the statistics of their ovariotomies at least by their errors in diagnosis, such as those lamentable cases in which through ignorance of obstetrics the healthy pregnant uterus has been opened. In order to guard against similar occurrences general surgeons might, it may be suggested, call the obstetricians in consultation, and this is usually done; but is it fair that the obstetrician who can diagnose a tumour and remove it should be prevented from operating by a surgeon who is only competent to remove it? Is

it fair that the treatment of the most important diseases affecting the organs which are the obstetric physician's special study, should be taken out of his hands? In any case is it fair that the question should be settled by medical committees in which the surgeons' votes numerically far outweigh the obstetric physicians'?

Medicine has been divided by our Universities, our Royal Colleges, and our medical schools, into three great divisions—Medicine, Surgery, and Obstetrics and Gynæcology. The third subject, obstetrics and gynæcology, is taught by the obstetric physicians of our medical schools. An obstetric physician without experience of operations labours under great disadvantages in teaching modern gynæcology: he is unable to compare the clinical signs with the actual facts of the case; he who should teach others is deprived of one of the most certain means of teaching himself; while in handing over to the surgeon his cases for operation he is giving up pathological material of the greatest value for the study of that branch of medicine which it is his duty to teach.

There is a natural connection between obstetrics and gynæcology, which is convenient in practice, and which it is impossible, even if it were advisable, to sever, and, since these subjects are the special study of the obstetric physician, I think it is right that he should have a free hand in the treatment of the diseases which come within their domain. And I would further appeal to our surgical colleagues in the medical schools to extend their generosity and give up to the obstetric physicians the operations upon the uterus and its appendages. Such a gift would entail but a small sacrifice upon the surgeon; for the days are past when a general surgeon in London will get any considerable number of gynæcological operations; while it would be appreciated as a great boon by the obstetric physicians, it would enhance the value of gynæcological teaching, promote the cause of scientific medicine, and above all be, I believe, the means of saving human lives.

Dr. Routh asserted that the great work in connection with these operations had been done by specialists in special hospitals. Before the Samaritan and other special hospitals were instituted the mortality in general hospitals with ovariotomy was well known to have been excessive. Formerly the mortality was from 20 to 30 per cent., but it had been gradually reduced to 5 per cent. and under. The introduction of antiseptics was, however due in London entirely to a general

TABLE I. A FIRST SERIES OF FIFTY OVARIOTOMIES.

No.	Initials.	Age.	Married or Single.	No. of Children.	No. of Abortions.	Date of Operation.	No of Minutes Operation lasted.	Name of Attendant.	Side.	Adhesions.	Drainage.	Highest four-hour Temperature in first week. R=Rectal A=Axillary °	Recovered or Died.	Remarks. G = Girth at Umbilicus. GG = Greatest Abdominal Girth.	Alive and free from Hernia.
1	S. V.	63	M	2	0	Oct. 15, 1887 ..	60	Mr. R. A. Skinner ..	L	Yes	Yes	101·2 (R)	R	Multilocular ovarian, size of three Rugby footballs. Previously tapped several times ..	Oct. 30, 1893.
2	S. D.	46	M	4	0	Oct. 29 ,, ..	40	H. R. S.	L	Yes (to wall and intestines)	No	101·8 (R)	R	Large multilocular cyst; much solid growth. Stitch-hole abscess formed	Oct. 22, 1893.
3	E. B.	67	M	18	1	Nov. 3 ,, ..	..	H. R. S.	L	Yes (numerous)	Yes	101·6 (R)	R	Large multilocular ovarian. G=45¼ in. T=100°·4, P=132, and patient very ill two hours before operation	Seven months later.
4	S. M.	42	M	0	0	April 8, 1889 ..	..	H. R. S.	L	Yes	Yes	101·4 (R)	R	Large broad ligament cyst 10½ in. above pubes. G=35½ in. Tumour enucleated, broad ligament stitched, and dropped	Dec. 31, 1889.
5	E. B.	26	S	0	0	Aug. 12 ,, ..	..	Dr. Riding	R & L	Yes	No	101 (R)	R	Two multilocular ovarian cysts, size of orange and small apple	Six months later.
6	A. S. C.	39	M	0	0	Aug. 25 ,, ..	..	H. R. S.	L	Yes (to sac)	Yes	101·2 (R)	R	Multilocular broad ligament cyst, burrowing around uterus. Main part enucleated; drained	End of 1892.
7	J. E. M.	47	M	5	6	Sept. 3 ,, ..	20	Mr. J. M. Bromley ..	R & L	No	No	100·6 (R)	R	Large left ovarian (17 pints). G=38½ in. Right ovarian fibroid (size of filbert)	Oct. 24, 1893.
8	M. W.	26	M	2	0	Sept. 14 ,, ..	..	H. R. S.	L	Yes	Yes	100 (R)	R	Small broad ligament cyst, size of duck's egg. Partially enucleated; drained .. .	— —
9	L.	50	M	0	0	May 27, 1890 ..	..	Dr. Williams-Freeman	R	Universal	No	100·4 (R)	R	Multilocular ovarian, size of eight months' uterus (11 pints). Twisted pedicle	Oct. 29, 1893.
10	H. R.	66	M	0	1	June 27 ,, ..	..	Dr. Barnett	R & L	No	No	100·8 (R)	R	GG=35 in. Left ovarian to within 1 inch of ensiform. Cystic right ovary	Oct. 24, 1893 (small hernia, giving no trouble).
11	J. H.	58	M	0	0	Aug. 2 ,, ..	..	Dr. J. W. Bond ..	L	Yes (to wall and intestine)	No	101·4 (R)	R	G=47 in. Multilocular ovarian, larger than football	Oct. 11, 1893.
12	E. G. S.	18	S	0	0	Nov. 15 ,, ..	40	Dr. Ringer	L	No	No	101·8 (R)	R	2½ gallons ascitic fluid; cystic multilocular ovarian, size of uterus at term, previously tapped; complicated with pleural effusion. 97 ounces drawn from left pleura 2 days before operation	End of 1892.
13	H. N.	59	M	4	0	Feb. 10, 1891 ..	23	Mr. Clement Pound ..	R	No	No	100 (R)	R	Ruptured multilocular ovarian, holding about 1 pint	Oct. 22, 1893.
14	C. F.	54	S	0	0	Mar. 20 ,, .	28	Mr. Sworn	L	Very slight near pedicle	No	101·6 (R)	R	Multiloculor ovarian, size of large football	Oct. 24, 1893.
15	E. W.	27	S	0	0	April 1 ,, ..	22	Mr. T. F. Gardner ..	L	No	No	99·2 (A)	R	Unilocular parovarian, size of small football, removed with ovary	Nov. 1, 1893.
16	S. A. S.	23	M	1	0	April 16 ,, ..	60	Mr. Ludford Cooper ..	R	Yes (to surrounding parts)	Yes	103·4 (R)	D	Suppurating dermoid, size of emu's egg. Ulcerative colitis, which probably infected bloody serum in pelvis	Died.
17	A. H.	28	M	0	1	May 6 ,, ..	50	Mr. F. Stedman ..	L	Yes; strong (to bladder, uterus, and intestines)	No	99 (A)	R	Multilocular ovarian, size of goose's egg	Nov. 11, 1893.
18	E. P.	40	M	0	0	May 16 ,, ..	36	Dr. Arthur Roper ..	L	Yes (a few to wall)	No	99·4 (A)	R	Multilocular ovarian, size of uterus at sixth month	Oct. 24, 1893.
19	C. M.	40	M	2	0	May 26 ,, ..	30	Dr. C. J. Plummer ..	R & L	No	No	101 (A)	R	G=42 in. Right multilocular, size of uterus at term, 11½ in. above pubes; left, size of pear. Twisted pedicle	Nov. 2, 1893.
20	A. B.	42	M	0	0	June 15 ,, ..	44	Mr. L. B. Claremont ..	L	Of edge of ruptured cyst to wall	No	101·6 (A)	R	Ruptured malignant ovarian; removed. G=43½ in.	June 1892 (recurrence).
21	C. F. H.	27	S	0	0	June 26 ,, ..	65	Dr. Radcliffe Crocker ..	R & L	Yes	No	99·2 (A)	R	Right unilocular ovarian, with Fallopian tube opening into it, size of man's head. Left tubo-ovarian, size of fist. Patient had facial lupus	Nov. 2, 1893.
22	M. S.	22	M	0	0	July 3 ,, ..	40	Mr. F. E. Pearse ..	R & L	Yes (to abdominal wall over front)	No	100·2 (A)	R	GG=31½ in. Large right multilocular dermoid. Small blood cyst of left ovary	April, 1893.
23	J. B.	49	M	4	1	Sept. 14 ,, ..	20	H. R. S.	L	No	No	101 (A)	R	Small parovarian, size of goose's egg; enucleated. Hole in ligament stitched and dropped	Oct. 3, 1893.
24	M. C.	32	M	1	0	Oct. 12 ,, ..	50	Mr. F. F. Jones ..	L	Very strong	No	101 (A)	R	G=35¼ in. Suppurating ovarian after confinement. Over 16 pints of pus. Fever and extreme emaciation before operation. Pus burrowing in abdominal wall. Tumour removed. Suppuration recurred at lower angle of wound. Confined Aug. 13, 1893	Oct. 23, 1893.
25	M. P.	45	M	3	0	Oct. 26 ,, ..	40	Mr. Frank Collins ..	R & L	Yes, strong (to wall, omentum, bladder)	No	99·6 (A)	R	G=38¼ in. Large multilocular ovarian within 2 inches of ensiform. Small 2-inch multilocular cyst of other ovary. Previously tapped.	Nov. 3, 1893.

TABLE I—*continued.*

No.	Initials.	Age.	Married or Single.	No. of Children.	No. of Abortions.	Date of Operation.	No. of Minutes Operation lasted.	Name of Attendant.	Side.	Adhesions.	Drainage.	Highest four-hour Temperature in first week. R = Rectal A = Axillary	Recovered or Died.	Remarks. G = Girth at Umbilicus. GG = Greatest Abdominal girth.	Alive and free from Hernia.
26	C. J.	23	M	1	0	Oct. 30, 1891 ..	30	H. R. S.	L	No	No	99·6 (A)	R	G = 31½ in. Parovarian, holding over 10 pints, removed with ovary. Delivered with forceps in U.C.H., Maternity, August 28, 1891. Highest puerperal temperature, 99°·6	Oct. 26, 1893.
27	S. D.	52	M	4	0	Nov. 9 ,, ..	23	Mr. H. P. Miller ..	R	No	No	100·8 (A)	R	Multilocular ovarian (10½ pints)	Oct. 23, 1893.
28	R. A. C.	37	M	1	1	Nov. 18 ,, ..	65	Mr. R. A. Skinner ..	R	No	Yes (3 days)	100·4 (A)	R	Parovarian (6½ pints collected); enucleated. Broad ligament stitched and drained ..	Oct. 30, 1893.
29	M. C.	54	M	4	0	Dec. 11 ,, ..	45	Dr. W. Neale	R and L	Yes (to wall)	No	100 (A)	R	GG = 32½ in. Right multilocular ovarian (4 pints + 2 lbs. 6 ozs.). Left multilocular ovarian size of cocoanut	Oct. 26, 1893.
30	W.	39	S	0	0	Dec. 31 ,, ..	45	H. R. S.	R	Yes (to wall, up to diaphragm right side, to epigastrum left side)	Yes (2 days)	101·6 (A)	R	G = 51 in. Multilocular ovarian (26 pints). Influenza, 10th to 15th day	Nov. 4, 1893.
31	E. H.	27	M	3	0	Feb. 16, 1892 ..	30	Mr. A. G. Don.. ..	R	Yes (to wall and omentum)	No	100 (A)	R	GG = 34 in. Pregnant 3 months at operation. Flaccid multilocular ovarian (6 pints). Delivered of twins, Aug. 12, 1892	Nov. 1, 1893.
32	M. B.	41	M	2	0	Mar. 10 ,, ..	49	Mr. P. S. Jakins ..	R	Yes; strong (to wall and pelvic viscera)	Of abdominal wall for 24 hours	99 (A)	R	Ovarian. Three pints fœtid pus. Noticed after confinement, June 24, 1891. Treated for typhoid. Tapped twice three weeks before operation (10 pints pus). Trocar left in three weeks. Septicæmia	Oct. 24, 1893 (small hernia size of a walnut).
33	E. P.	35	M	6	0	Mar. 27 ,, ..	32	H. R. S.	R	Yes (to intestines, omentum, and wall)	No	101 (A)	R	GG = 31½ in. Multilocular ovarian, size of uterus at term. Twisted pedicle. Patient confined, Dec. 15, 1891	
34	C. B.	64	M	7	2	April 4 ,, ..	27	H. R. S.	L	No	No	99·8 (A)	R	GG = 42 in. Multilocular ovarian (6 pints collected, some lost)	Nov. 1, 1893 (hernia).
35	C.	31	M	1	0	April 19 ,, ..	45	Dr. A. H. Buck ..	R and L	No	No	102 (A)	R	Right multilocular ovarian, reaching 8 in. above pubes. Left cystic ovary. Swelling noticed after difficult instrumental confinement 21 months ago	Oct. 27, 1893.
36	N.	32	S	0	0	April 28 ,, ..	29½	Dr. B. N. Dalton ..	R and L	No	No	99·2 (A)	R	Right multilocular ovarian, size of shaddock. Left multilocular ovarian, size of small orange	June 15, 1893.
37	C. E. T.	39	M	10	5	June 4 ,, ..	59	Mr. H. P. Miller ..	R	Yes; very strong (to wall and intestines)	No	101·2 (A)	R	Delivered Dec. 28, 1891. Tumour noticed 10th day. Suppurating multilocular ovarian, with twisted pedicle, size of large fist. Complicated with pleurisy	Oct. 31, 1893.
38	A. W.	34	M	1	0	June 9 ,, ..	80	H. R. S.	L	Yes; strong (to wall, intestines, omentum, rectum, uterus)	Yes (24 hours)	102·2 (A)	R	Ovarian, size of fœtal head. Complicated with hydrosalpinx (removed)	Oct. 10, 1893.
39	I. B.	40	S	0	0	June 16 ,, ..	50	Mr. W. C. Hearnden ..	R	Yes (all over front)	No	99·4 (A)	R	GG = 41 in. Multilocular ovarian, within 2 in. of ensiform	Oct. 30, 1893.
40	L. B.	24	S	0	0	June 22 ,, ..	60	?	R	Yes (to wall, omentum, uterus, bladder, intestines, appendix, and ureter)	No	101·6 (A)	R	Multilocular ovarian (8½ pints). Tapped 3 months ago, 3 gallons removed..	June 14, 1893.
41	A. M.	30	M	3	1	Sept. 17 ,, ..	35	Mr. J. M. Biggs ..	R	Yes	No	100·6 (A)	R	Dermoid ovarian (13 ounces of fluid and hair and fat)	Jan. 16, 1893.
42	N.	31	S	0	0	Sept. 29 ,, ..	20	Mr. A. W. Pearse ..	R and L	No	No	100 (A)	R	Multilocular ovarian (10 pints). Left cystic ovary	Oct. 14, 1893.
43	M. P.	26	S	0	0	Nov. 2 ,, ..	25	Dr. J. C. Fletcher ..	R	No	No	99·6 (A)	R	Multilocular ovarian, size of shaddock	Some months later; married.
44	M. F.	43	S	0	0	Dec. 5 ,, ..	70	Mr. G. Ingledew ..	L	Yes (to broad ligament and uterus)	Yes (gauze in broad ligament)	102·8 (A)	R	G = 45 in. Enormous malignant colloid cystic tumour of left broad ligament, previously tapped three times, weighing about 70 lbs.; invading the uterus. Enucleated. Hysterectomy	Oct. 5, 1893.
45	T.	37	S	0	0	Dec. 11 ,, ..	30	Dr. B. N. Dalton ..	R and L	Very slight	No	100·4 (A)	R	Right unilocular ovarian, reaching within 1 in. of ensiform. Left cystic ovary. Convalescence delayed by thrombosis of left femoral vein	Oct. 31, 1893.
46	M. A. F.	82¼	M	5	0	Dec. 19 ,, ..	17	Mr. Rickman Godlee ..	L	No	No	99·2 (A)	R	Multilocular ovarian. G = 37 in. Tumour rises 10 in. above pubes. Twisted pedicle ..	Nov. 1, 1893.
47	M. J.	23	M	1	0	Jan. 31, 1893 ..	29	Dr. J. C. Fletcher ..	L	Extensive to omentum	No	102 (A)	R	G = 36¾ in. Confined 6 weeks ago. Suppurating ovarian (15 pints); T = 103°·6, P = 140 night before operation. Papilloma in interior	Oct. 31, 1893.
48	M. M.	19	S	0	0	Feb. 20 ,, ..	37½	Dr. J. C. Fletcher ..	R	Yes (to wall)	No	101·4 (A)	R	G = 30 in. Multilocular ovarian (6 pints). Twisted pedicle	Oct. 23, 1893.
49	L. W.	58	M	1	0	Mar. 6 ,, ..	70	Mr. Walter Rigden ..	L	Slight	No	100 (A)	R	Multilocular papillomatous ovarian (8½ pints puriform fluid)	July 28, 1893 (small ventral hernia).
50	A. H.	26	M	2	0	April 15 ,, ..	72	H. R. S.	R and L	No	No	100·6 (A)	R	Multilocular ovarian dermoids. Right, size of walnut; left, size of swan's egg. Complicated with large ventral hernia (excised). Confined March 25, 1892. Tumour noticed shortly afterwards	July, 1893 (slight separation of recti).

surgeon, and had altogether changed the conditions under which these operations were performed at present. That principle, it was true, had been proclaimed by Sir Joseph Lister, but it had been most scrupulously applied in the wards of the special hospitals, with the result that septic cases were now rarely met with. In reference to tapping ovarian cysts he said he had collected statistics many years ago which gave the mortality of tapping at something like 40 per cent.; still there are cases in which it was justifiable to aspirate, and not use the trocar, for diagnostic purposes. This did not involve the slightest danger, provided the proper precautions were taken to secure perfect asepsis. As to flushing, he ventured to think that if the author had had recourse to it in one of his cases, the case in which there was putrid pus in the cyst, the result might have been different. When putrid pus found its way into the peritoneal cavity it was almost impossible to thoroughly cleanse the folds around by mere sponging in the way that flushing did.

Mr. A. Pearce Gould felt strongly that the present success of ovariotomy was mainly due to surgeons, and most of all to Sir Joseph Lister. It was by adopting the antiseptic treatment that Dr. Spencer and others had been enabled to obtain their brilliant results. He presumed that the author had not read his paper with the object of provoking a discussion on the subject as a whole. The point of the paper was, like the sting of certain animals, in the tail, for this tail dealt with the question as to which order of practitioners, surgeons or gynæcologists, was best qualified to deal with this particular class of case. The author had made a kind of Christmas appeal to the surgeons to relinquish some of the most interesting of their cases in favour of the obstetric physicians and gynæcologists. In listening to the paper one was almost persuaded by him, though one or two lingering doubts remained. Dr. Spencer would doubtless admit that in no region of the body was there greater room for error of diagnosis than in the abdomen. One well-known surgeon used to say it was as impossible to be certain what was inside the abdomen before operation as it was to say what a table was made of without removing the cloth. Without going as far as that, he would affirm that an accurate and certain diagnosis was often only possible when the abdomen had been opened. It was unfortunately the case that with the advance of abdominal operative surgery, the diagnosis of abdominal conditions had tended to fall into the background. Surgeons, and he might say physicians too, were content to postpone their diagnosis until the abdomen was opened. Nature had not made any hard-and-fast distinction between ovarian and other tumours. Patients did not come to them labelled. Hence it followed that he who undertook to open the abdomen ought to be able and willing to deal forthwith with whatever condition presented itself, and he found in this a strong argument for allowing surgeons rather than gynæcologists to undertake all abdominal operations. Further, the easiest major intra-abdominal operations were indisputably the very cases which Dr. Spencer would wish to appropriate entirely to his own department of practice. He felt strongly that the experience which he gained in doing these comparatively simple operations was immensely useful in helping him to deal with more difficult cases, such as intestinal obstruction or complicated abdominal tumours. If surgeons, from motives of mistaken generosity were to relinquish these cases and limit themselves entirely to the more complicated, difficult, and dangerous cases they would lose a considerable part of the experience which they now had the opportunity of acquiring

to prepare them for the performance of the more critical operations. It must not be forgotten that the principles, and also the details of the treatment of ovarian and uterine tumours are those common to other surgical affections, and there is no fundamental reason why surgeons should be excluded from dealing with a class of cases which needs neither special knowledge nor special manual dexterity. It was not difficult to demonstrate the practical inconvenience that may arise from any such arbitrary division of labour as suggested by Dr. Spencer. He had been present at an operation undertaken by a certain distinguished gynæcologist for what had been diagnosed to be an ovarian tumour. When he cut down on the tumour it turned out to be a kidney, and the gynæcologist thereupon remarked that it was hardly within the scope of his practice, and he suggested that the operation should be completed by a general surgeon. It is only fair to say that this course was not followed, and his friend completed the operation with skill and success. Still, he felt that for a surgeon who had commenced an operation to desist upon discovering that the disease was something else than he had anticipated, and, therefore, to hand over the operation for completion to another practitioner, was certainly gravely inconvenient. He had been asked during the present year by a gynæcologist who was in the habit of operating on ovarian tumours, to operate on a rather obscure abdominal case which it was thought was not of the kind with which he would like to deal. He (the speaker) therefore opened the abdomen and found an ovarian tumour with a twisted pedicle. How ludicrous it would have been for him to have thereupon handed over the knife and the forceps to his colleague for him to complete the operation. That was what would happen if they drew this hard-and-fast line. He thought that for the present the practice followed at the Middlesex Hospital was, perhaps, the best, where the surgeons and obstetric physicians operated on the cases that came into their respective departments.

Dr. Duncan said it was recognised that the mortality of each surgeon diminished as his experience increased. With regard to incomplete operations, he referred to two cases in which he had been obliged to do incomplete ovariotomy, for in both cases the ovarian cyst was embedded in such a mass of pelvic cellulitis that it could not be removed. He therefore tapped them, stitching the edges of the opening in the cyst to the edges of the abdominal wound, and both patients were at present perfectly well without a trace of the cyst. The author had been fortunate in having had only one case of suppuration along the sutures. The fault lay perhaps less with the operator than with the material employed, though it might be said he was to blame for not making sure that his material was incapable of causing injury. Years ago he had a series of cases in which stitch suppuration occurred, but since he had taken the precaution to thoroughly boil the silk and keep it in carbolic acid the accident ceased to occur. When the adhesions were firm and extensive he was in the habit of using a drainage tube for 24 or 48 hours, and he was only able to recall one case in which any disadvantage had followed its use. In that case the omentum had got entangled in the openings in the tube, and when this was withdrawn the omentum was drawn out and caught between the abdominal walls and became strangulated, necessitating re-opening of the abdomen and causing death. He presumed the author himself did not condemn flushing in the cases alluded to by Dr. Routh, and he agreed that flushing was useful in such cases. He strongly disapproved of taking the temperature in the axilla on account of its uncer-

tainty. It was much better to take it in the mouth or in the vagina. He paid less attention to the temperature than to the pulse. As long as the pulse kept below 100 he did not fear a rise of temperature, some women being so easily affected by trifling circumstances. He never gave the patient anything for 24 hours, except a teaspoonful of hot water every hour if thirsty. If there was vomiting, and especially retching, then he advocated giving half a pint or so of hot water to clear out the stomach. He thought that the author had made out a very good case for relegating these operations to obstetric physicians. That this would come to pass ere long he felt sure. It was not so very long since that obstetric physicians were forbidden to operate at all, and he was the first to whom the permission had been accorded at Middlesex. He urged that these cases ought to be in the hands of one surgeon or of the obstetric physician. He pointed out that the whole process of obstetrics was surgery rather than medicine, and for that reason they ought properly to be called obstetric surgeons. The fault of this unfortunately lay with the College of Surgeons, which in years gone by refused to have anything to do with obstetricians, who had to take refuge under the wings of the sister college.

Mr. Harrison Cripps said that he had listened with the greatest pleasure to Dr. Spencer's success with his early ovariotomy cases, and congratulated him on the care and judgment he had shown, and on the sanitary conditions of the University College Hospital. It was not, however, with the view of discussing the details of the cases reported, but rather on the general question of policy as to whether these major operations should be undertaken by those whose training had specially qualified them for surgery, or by such as had pursued the more learned but less exciting path of a physician's career. He held that there were two types of mind amongst those who joined their noble profession—the one who was not content to wait and who, through natural intrepidity and enterprise, desired to obtain immediate results, while the other was content to investigate disease and its effects, and observe how much nature could do for the restoration of our bodies when allowed to work under favourable circumstances. As to these types he believed that the one had been of as much service to humanity as the other, and he believed the best powers of both would be spoilt if forced into an occupation where both qualities are required in perfection in the same individual. Just as in the general treatment of disease these two qualities have long been specialised with advantage, so it appeared to him that there was equal room in the diseases peculiar to women to have the same division of labour. From time to time, at some particular hospital, there might be an individual who, notwithstanding a medical training, showed an exceptional aptitude for surgery. If such there were then let him by all means adapt himself so far as he could to surgical work. Let him learn not merely how to deal with such tumours as he expects to find in the pelvis of women, but let him also know how to deal with those tumours which are frequently met with, and which turn out to be entirely different from what he had previously diagnosed; for he held that an operator in such cases should be prepared to deal with all he finds in the abdominal cavity. Is the obstetric physician, when he finds that the supposed ovarian tumour is an hydatid of the liver or a sarcomatous kidney, to close the wound and call in a surgical colleague to complete the removal? Is he to undertake the treatment of hæmorrhage of a wounded iliac, the cure of abdominal hernia—the result of his operations? Is he to study intestinal obstructions such as not infrequently follow on ovarian operations, or is he to rely in such matters for other surgical assistance? He ventured to say

without hesitation that the ovarian operator should not only be capable of dealing with all these complications, but that he should be able to do so in the best possible manner, such as can only be accomplished by a wide knowledge of surgery and the witnessing of such procedures in the hands of the best masters. Such operations require the widest range of surgical experience. Let him, therefore, train himself with all the care that is demanded by the highest standard. If he will undertake to do this, then he (the speaker) could see not only no objection but every reason why he should undertake ovarian operations, but why any longer keep the title of physician? There is so much required to keep abreast of advancing surgical knowledge that he took it that such a man could with advantage give up obstetrical work, and a large amount of purely medical work of great importance to an obstetric physician. Again, the value of having physicians who, not being operators, could give entirely independent opinions was of the greatest advantage. No matter who the operator might be, he often could not help, quite unconsciously, giving advice in favour of his own operative procedures, and it was of immense advantage, both to himself and to his patient, to have the opportunity of discussing certain cases in all their aspects with a physician who approached the case from a somewhat different point of view. There is plenty of room for pure obstetric physicians in London, and he held that it had been of great advantage to the profession to have had such independent men who never practised abdominal surgery. In making these remarks he would have it understood that they were not in the least applicable to the able reader of the paper; but he believed that speaking generally the true interests of the profession and the welfare of the patients would be best consulted by leaving abdominal tumours to be dealt with by those who have had special training as surgeons; while the physician would still continue the valuable work suitable to his own training and methods, and that it might yet be possible for patients to have the advantage of the views of these different styles of mind which, without rivalry or jealousy, meet together in consultation, and do their utmost for the patient's benefit.

Dr. Playfair said the paper was on a subject in which he had long taken considerable interest. The history of how obstetric physicians came to be so styled was curious, because the practice of obstetric physicians and gynæcologists was far more surgical than medical. The more gynæcology advanced in scientific accuracy the more surgical it becomes, though no gynæcologist ought to undertake these operations unless confident of his ability to cope with the possibilities. A man, however, could not be a gynæcologist unless he was really a surgeon. It was ridiculous to expect him to deal with certain pelvic conditions only from below, limiting his purview at the brim of the pelvis. When he first began practice, 30 years or more since, there were no obstetric physicians who did operations. The first, he believed, was Dr. Tyler Smith, of St. Mary's Hospital, whose operative skill had probably passed from the knowledge of the present generation. It was not, he believed, at University College Hospital that the obstetric physician first performed these operations. When he was out-patient physician at King's College Hospital, although he held the same opinion as now as to obstetric physicians being surgeons when they had the necessary skill and confidence, he saw such terrible results from the way in which his surgical colleagues performed ovariotomy at that time—although they were men of the highest eminence—that he got into very bad odour for sending all

his operation cases to the Samaritan Hospital, where he knew they would be treated with better results to the patients. Then Lister came—that was in 1879 or 1880—and thenceforth they operated with the happiest results. That was due solely and entirely to rigid Listerism. He agreed that everyone belonging to the profession should be left to do what he felt himself most capable of doing. He could not conceive how this old Tory idea that the surgeon was the only man to operate could have come about. This country was, he thought, unique in this respect. In no other country on the Continent or in America did any such view obtain. Only a month or two before the profession experienced a great loss in the person of the illustrious President of the College of Physicians, Sir Andrew Clark, who in the course of conversation had assured him that he was quite satisfied that obstetric physicians should undertake such operative procedures as came within the scope of their calling. He would not trespass on the time by further allusion to historical details. Referring to the method of closing the wound in the abdomen, he had given up the practice of using deep and superficial silk sutures because they constantly gave rise to hernial protrusions. At present he used four rows of buried gut sutures, joining the peritoneum, the muscle, &c., layer by layer, and he had not seen or heard of any hernia protrusion since. He was convinced that in abdominal operations the drainage tube was used with unnecessary frequency. He had had a series of 30 or 40 laparotomies without a death and without ever using a drainage tube. With flushing, on the other hand, all the advantages were on the other side, and he had never seen the slightest inconvenience follow its use.

Dr. Herbert Spencer, in reply, said that in his paper he had endeavoured to show that, at the present day, operations could be at least as successful in general as in special hospitals. He entirely dissented from Dr. Routh's recommendation of aspiration for diagnosis, and thought that no diagnostic value was to be attached to the examination of the fluid of ovarian tumours. Mr. Pearce Gould had said that the chief part of the argument lay at the end of the paper "like a sting;" as a gynæcologist, he would prefer the simile of the postscript of a lady's letter. He agreed with Mr. Gould that the difficulties in the diagnosis of ovarian tumours were sometimes great—an indication, he thought, for special experience, which could not be obtained by general surgeons—but the difficulties were usually connected with the differential diagnosis of pelvic tumours; the gynæcologist, at any rate, rarely had any difficulty in diagnosing these from other abdominal tumours. Of course the gynæcologist should be prepared to deal with any tumour which presented itself, and his experience in removing ovarian and uterine tumours would, according to Mr. Gould's admission, and the case he quoted, prove an excellent training for this. He (Dr. Spencer) did not suggest that, in the middle of an operation, the knife should be handed over to another; but that, where the diagnosis was made beforehand, ovarian tumours should be placed in the care of the obstetric physicians.

In reply to Dr. William Duncan, he was of opinion that nearly every ovarian tumour which was not malignant could and should be completely removed, and he did not think absence of suppuration was to be attributed to good luck. He would like to see some record of the number of cases of hernia that occurred in the practice of those who frequently employed the drainage-tube.

He feared he had not fully apprehended the purport of Mr. Harrison Cripps's opening remarks: he gathered from them, however, that Mr.

Cripps held that the man who wants patients goes into surgery; Dr. Spencer thought that the desire for patients was not entirely limited to the surgeons. In opposition to Mr. Cripps's opinion that it was advantageous to patients that obstetric physicians should not operate, he (Dr. Spencer) had heard of cases where patients in the country seen in consultation by non-operating obstetricians had actually died before a surgeon could be obtained to operate. He had not said that ovariotomy was first performed by obstetricians at University College Hospital; but that it was mainly owing to its successful performance in that hospital over a long period, by Dr. John Williams, that the obstetric physicians of other London hospitals had obtained the privilege to operate. He would pay more attention to Dr. Playfair's remarks upon hernia when he published full records of his cases instead of general impressions. He was happy to find that the obstetric physicians were in agreement with the general tenour of the paper, and, while thanking the surgeons for their courteous remarks, he would remind them that they had not discussed the two most important points of his paper, viz., the influence of the performance of ovariotomy by surgeons and by obstetricians respectively upon the welfare of the patients and on medical education.

January 8th, 1894.

A CASE OF ACUTE PERIPHERAL NEURITIS (?), FOLLOWED BY MULTIPLE ANKYLOSES, WITH ATROPHY OF GROUPS OF MUSCLES AND OF CUTANEOUS AREAS IN THE LOWER EXTREMITIES.

By William Anderson, F.R.C.S.

The patient, a boy aged 15, was admitted into St. Thomas's Hospital on the 2nd of July, 1891.

History.—At the end of December, 1890, he was brought home, after a hard day's skating, in a state of exhaustion. When seen two days later by Mr. Charles Allen, of Upton Park, to whom I am indebted for the record of the early symptoms, he was extremely prostrate, with a temperature of 103°, and complaining of severe pains in the lower extremities. In the course of a few days swelling appeared in the knee and ankle joints of both limbs, and the fever was associated with profuse perspirations. There seemed to be no impairment of consciousness all the time, but the patient says his memory is a complete blank as to the events of the first five or six weeks of his illness.

About six weeks after the beginning of the disease, despite an

intercurrent attack of bronchitis, he began to improve; the fever abated, and the joint swelling decreased; but the amendment speedily gave place to a relapse. In the middle of March, ten weeks from the onset of the symptoms, an abscess appeared in the left thigh, and after the evacuation of the pus the temperature fell permanently to the normal standard. The boy, however, was extremely emaciated, and nearly all the joints of the lower limbs although no longer swollen were rigid and very tender on manipulation. Shortly afterwards, during an attempt made by his medical attendant to restore function by passive movement under chloroform, the tense inelastic skin over the left knee gave way, leaving a rather wide laceration, which, however, did not extend into the joint. A fortnight later he was sent into the hospital.

The previous history of the boy was good. He had had no severe illnesses, and there appeared to be no family predisposition to rheumatism or any other constitutional affection.

On admission, six months after the commencement of the disease, he was a pale attenuated lad, of fair height for his age. The whole body was greatly wasted, but while the trunk and upper extremities were functionally normal, the joints of the lower limbs were rigidly fixed, the hips, knees, and ankles in an attitude of extension, the digits in the position of hammer toes; one joint only, that of the astragalus with the calcaneum and navicular, retaining its normal mobility. Besides this, certain groups of muscles in the lower extremities were distinctly atrophic, and the skin was thinned, tightly stretched over the articular ends of the bones, and striped transversely along the whole length of the limb with bars of linear atrophy. There was no thickening or effusion about the affected articulations, and no deformity of the end of the bones, but attempts at motion in any direction gave rise to acute pain.

Two discharging sinuses were present over the left limb; one in the thigh, the result of the abscess before mentioned; the other opposite the knee, due to the breach of integuments produced in the attempt to flex the joints under an anæsthetic, and there was considerable inflammatory thickening around the femur.

On examination of the muscles by the galvanic current, degenerative reactions were found in both legs. On the right side, in the extensor longus hallucis, tibialis posticus, flexor longus digi-

torum, and flexor longus hallucis; on the left side in the corresponding muscles, and also in the tibialis anticus, extensor longus digitorum, and peronei. The gastrocnemii and solei of both limbs were greatly shrunken, but reacted fairly to the current. The sensibility of the skin to touch, heat, and cold, when compared with that in a healthy boy of the same age, was found to be diminished by about one-half over the extensor aspects of both legs, and the area of the anterior tibial nerve between the first and second toes on each side was almost completely anæsthetic. The sensation was normal over the thighs and backs of the legs.

From this it appears that the defective sensibility was limited to the cutaneous branches of the external popliteal nerve and to the terminal filaments of the anterior tibial, while the motor pareses chiefly involved the deep branches of the posterior tibial nerve on both sides, and those of the anterior tibial and musculo-cutaneous on the left side.

After a week of simple rest, with liberal diet, he was placed under a course of massage and passive movement. This was persevered in by my dressers, Mr. Chance and Mr. Carver, with great care and judgment, and a steady improvement took place. The left hip and knee remained persistently stiff for some time after the healing of the sinuses, but the other articulations soon recovered sufficiently to allow the boy to walk with the aid of a stick. Health and nutrition progressed very rapidly, and he not only gained flesh, but added about 3 inches to his height before his discharge in May, 1892.

He has since been well, and is now able to bend all the articulations freely, and to walk firmly without any assistance. The muscular development is restored, and the only motion lacking is that of the interphalangeal joints of the toes. It may be remarked that the movements gained at the several articulations are perfectly smooth and free from any sense of grating. There was, in fact, nothing to lead to the belief that any osteo-arthritic changes had taken place. The left thigh, which had been the seat of abscess formation, still remains thickened, but there are no inflammatory symptoms.

Remarks.—The nature of the case is obscure. The earliest impression raised in the mind of Mr. Allen, who attended the patient during the first six months of the illness, was that he had contracted rheumatic fever, a view favoured by the multiple joint

swellings and profuse perspirations; but the negative evidence afforded by the absence of cardiac complication and the limitation of the joint trouble to the lower extremities, together with the later but positive indications of localised impairment of sensibility and motion, atrophy of the skin, and degeneration of certain groups of muscle, were strongly suggestive of a primary nerve lesion. Whether the lapse of memory for the events of the first six weeks has any special significance it is hard to say, but the fact deserves note.

The atrophic changes in the skin and muscle, taken together with the degenerative reactions demonstrated by the electrical tests, point to an acute peripheral neuritis, probably determined by the combined influence of a functional vertax upon the motor apparatus (in skating) and a prolonged depression of temperature in the nerves and other structures of the lower extremities; but the most peculiar features of the case are the sudden and acute febrile onset of the symptoms and the widely disseminated joint lesions from which only a single articulation in each lower limb escaped. I am of opinion that the ankyloses were extra-articular, and due to changes in the fibrous tissues around the joint, and not to any direct union of the cartilaginous surfaces.

The symptoms were complicated by the abscess of the thigh, which was not discovered till 10 weeks after the beginning of the affection. There is, however, no reason to believe that the local inflammation had any connexion with the earlier manifestations.

I have so far failed to discover any records of similar cases. Two very interesting examples of multiple joint lesions associated with changes in the skin were brought before the Clinical Society by Dr. Pasteur and Dr. Barlow in 1889, but these differ from the above in several essential points. In both the onset was subacute, the lesions were distributed widely over the head and neck and all four extremities, the ankyloses were less complete, the affected joints were for the most part maintained in the position of flexion, and the changes in the skin were more allied to sclerodermia than to atrophodermia. In Dr. Pasteur's case the child was, or had been, rachitic. In Dr. Barlow's case there were indications of rheumatism with generalised lymphatic enlargement. Both children were feeble and sickly before the appearance of the disease, and in this, as in other details, the conditions were different from those I have tried to depict.

The relations of the symptoms to those of the acute rheumatoid arthritis of children are worthy of consideration, but my own experience of the latter affection has not been sufficiently large to enable me to enter into the question.

Dr. de Havilland Hall (the Vice-President, in the Chair) said he had not met with any cases strictly comparable with those referred to by the author. Alluding to the abscess formation, he observed that it was somewhat remarkable this should have developed simply from friction. He suggested that the explanation would be the diminished vitality of the parts resulting from the primary nerve lesion.

Dr. Pasteur said the author had referred to a case brought by him (Dr. Pasteur) before the Clinical Society some years ago ('Clin. Trans.,' vol. xxii, p. 298), but had been careful to point out that there were very few points of resemblance between the two cases. In his own case the onset was well on the chronic side of subacute, and every joint in the four limbs, as well as the articulations of the jaws was involved, so that the patient could only open the mouth to a very limited extent. The condition, which had come on so gradually, had resisted every plan of treatment, and had steadily, though slowly, progressed. This patient first came under observation in 1888, and was still under his care, and he was fain to admit that her general condition was not appreciably better now than at the beginning, whilst the deformity had become very much accentuated. There was greatly diminished scope of movement in every limb on account of fixation of the joints which was obviously due to some external cause. The hands presented the most extreme degree of "clawing" which he had ever met with. Curiously enough the patient had not lost in any appreciable degree the capacity for the movements such as writing, sewing, knitting, &c. Reaction of degeneration had not been detected in the wasted muscles at any period of the disease. The skin affection, too, was of a different order to that observed in the author's case. It was of the glossy type, and was most marked over extensor surfaces of the wrist and ankles, and seemed unduly adherent to the subjacent structures. No alteration in the sensibility of the skin had been observed. He concluded that his case must be of a different nature to that of the patient whom they had just seen. He handed round some photographs showing the extreme deformity of the limbs of his patient. Dr. Barlow had recorded a case in the same volume of Transactions, which appeared to resemble his own case rather than the author's.

Mr. Lockwood suggested that the symptoms pointed rather to some form of infection, and it was difficult to imagine that massage or friction could have had any share in causing such extensive suppuration as this patient had evidently undergone. The cold to which the patient had been exposed would certainly favour infection, as had been proved by bacteriological experiments; for instance, with Pasteur's fowls. The condition of the joints seemed to point in the same direction. The author had not stated whether or not there was effusion into the joints, and whether, if such was the case, any of it had been examined. If the case were one in which infection had played a share, some of the usual lesions might have been anticipated, and the condition of the urine might have revealed it. He had never seen a patient suffering from any form of acute infection in whom the urine did not contain a cloud of albumen, and this could always be shown to indicate the presence of some micro-organism in the urinary

sediment. If the patient had had any form of infection, that would help to explain the peripheral neuritis, for it had been abundantly shown that peripheral neuritis often occurred in various forms of septic infection. In any event the case was as interesting as it was puzzling.

Mr. Richards suggested that the case might have been one of influenza, that malady being epidemic at the time. If due to influenza, they might possibly be able to trace out why the joints were affected. In peripheral neuritis from influenza the poison probably did not stop at the peripheral nerves, but extended to the spinal cord ; and he pointed out that joint lesions were not unknown in affections of the spinal cord. Hence influenza might have been the means of causing the transient affections of the joints in the case narrated by Mr. Anderson.

Mr. Anderson, in reply, said the question of possible infection had occurred to him, but he thought there were some points in the history of the case that disposed of any such possibility. For instance, the abscess in the thigh did not make its appearance until 10 weeks after the onset of the illness, and it was just after this that the muscular and skin changes, which are scarcely explicable on the infective hypothesis, were first noticed. Again, the traumatic condition involved one limb only, the other remaining intact, and there was no reason to believe that any of the joint effusions were purulent. As to the cause of the abscess, he gave it as it had been related to him, for when the patient was brought to the hospital only the remains were visible. There had evidently been very extensive suppuration, first from rupture of the integument of the knee, and, secondly, from inflammatory lesions in the thigh. The whole of the limb was much inflamed, and sinuses extended very widely. There was a history of effusion into the joints within three or four days of the beginning of the illness ; but when the patient was admitted into hospital no trace of fluid could be found. The joints were rigid, and any attempt at movement caused much pain, but eventually the movements were more or less completely restored. The urine did not seem to have been examined prior to admission, but it was tested on several occasions subsequently and no albumen was found. He suggested that it would be well to endeavour to group all the cases in which joint affections were associated with muscular and skin affections in order to clear up their relationship. Very complicated nervous symptoms had been traced to influenza, but he did not think that in this case any such etiology could be invoked. Dr. Allen, under whose care the patient had originally been, stated positively that there was nothing noticeable except fever and joint trouble, and there had never been any catarrhal or other symptoms pointing in the direction of influenza.

OBSERVATIONS ON SOME CASES OF DISEASES OF THE SKIN TREATED WITH THYROID GLAND.

By Phineas S. Abraham, M.A., M.D., B.Sc., F.R.C.S.I.

Having administered thyroid gland to a considerable number of patients suffering from psoriasis and some other diseases of the skin, and as many of the cases seem to me to have been under observation for a sufficient time to allow of a judgment of the

general effects of the remedy, I hope that I shall be considered justified in presenting these notes to the Society.

I need hardly say that I was led to make a trial of thyroid gland in this class of disease, in consequence of the interesting results brought before the Dermatological Section of the British Medical Association meeting, at Newcastle-on-Tyne in August last, by Drs. Byron Bramwell and Arthur Davies.*

It will be remembered that Dr. Bramwell gave an account of three severe cases of psoriasis which had benefited greatly under the administration of thyroid gland, two of them being absolutely cured in two months, and the third showing satisfactory improvement for six weeks. In a subsequent note, however, he informed us that the eruption in the last case had relapsed and got worse, in spite of an increased dose of the extract which he employed.

He also mentions in his paper several other slighter cases of psoriasis treated in the same way, in one of which the remedy did not produce any beneficial effect; in fact, during its administration, the eruption extended and increased (he observes, however, that this patient was taking at the same time full doses of bromide of potassium); another, moreover, he mentions in which the eruption, although disappearing from time to time under the thyroid, more than once reappeared. Dr. Bramwell, further, quotes a severe case of psoriasis under Dr. Stocker, of Dundee, in which the extract seemed to do little or no good.

Dr. Arthur Davies' communication referred to 4 cases: 2 of psoriasis, 1 of ichthyosis, and 1 of chronic eczema. The case of ichthyosis and 1 of the psoriasis cases were entirely cured without any other treatment, and the others had been much improved.

Since the observations of these gentlemen have been before the profession, the new drug has, I believe, been largely prescribed in cutaneous cases, especially for psoriasis; and a few notes have already been published on the results obtained. The communications that have come under my notice may be briefly alluded to.

Dr. Hartley, of Bedford, records† a case of psoriasis which had been slowly improving under other treatment, but in which after giving, in addition to other remedies, thyroid gland in powder,

* 'Brit. Med. Jour.,' August, and October 28, p. 933.

† 'Brit. Med. Jour.,' August, 1893, p. 763.

rapid improvement set in, so that in seven weeks every trace of the psoriasis had gone.

Dr. Leslie Phillips* gives notes of four cases treated as in-patients in the Birmingham Skin and Lock Hospital. The only case benefited was 1 of xeroderma; the results in 3 cases of psoriasis and in 1 of chronic eczema being quite negative. He similarly treated 3 cases of psoriasis in out-patients, but in none was there improvement. In 2 of the psoriasis cases the lesions increased under the treatment.

Dr. Talfourd Jones† gives a careful account of a case of psoriasis, in which he prescribed thyroid gland with anything but benefit. Dr. Jones observes: "In this case the spread of the skin disease under the thyroid treatment, the loss of flesh, the cardiac troubles, the faintness, the pyrexia, coupled with the disappointment to patient and doctor, are worthy of the careful attention of all who may desire to prescribe this remedy in psoriasis."

Mr. Balmanno Squire‡ informs us that he has tried the thyroid extract in 2 cases of psoriasis with no beneficial result.

And Dr. J. F. Gordon Gill, on the other hand, reports§ excellent results in 3 out of 4 cases of psoriasis; in the 4th case, although there seemed improvement at first, the disease remained stationary for a time, and then began to spread again. He discontinued the treatment on account of headache, general *malaise*, and dyspepsia. In another case, of acne rosacea, there appeared to be but little improvement after a month.

Of the 17 cases of psoriasis treated with thyroid by the above authors, I presume that only 7 can be regarded as definite successes. I would further remark that I do not think that the entire removal of the lesions of psoriasis in 7 or 8 weeks, even in severe cases, so very extraordinary. I have more than once observed a similar result, and in a much shorter time, under vigorous treatment with external tar and other applications.

I commenced to employ thyroid gland, in the form of Messrs. Burroughs and Wellcome's tabloids (each containing 5 grains of the dried gland of the sheep), early in August, just 5 months ago, and since then the number of patients for whom I have prescribed

* 'Brit. Med. Jour.,' November 25, 1893, p. 1152.
† 'Brit. Med. Jour.,' December 30, 1893, p. 424.
‡ 'Brit. Med. Jour.,' January 6, 1894, p. 13.
§ 'Lancet,' January 6, 1894, p. 19.

them has amounted to about 100. My observations, however, will refer only to 90 cases, for I have been unable to find the notes of several others that have been so treated. A certain number of these 90 may be left out of consideration; for, as will be seen, they did not take the tabloids for more than a week or two, in fact several of the patients did not show themselves again after the thyroid was first ordered. In the light of my other cases, I can hardly regard these as immediate cures; it is more likely, indeed, that the patients did not appreciate the medicine, and, consequently would have nothing more to do with the doctor!

Of the number here recorded, 42 were patients at the Western Skin Hospital, 37 at Blackfriars,* 7 at the West London Hospital,† and there were 4 other private cases.

To tell the truth, I have been rather chary of trying the treatment on private patients. One young lady, sent to me by my friend, Dr. Ransford, declared that the lozenges were "disgusting," and, after the first dose, declined point-blank to take any more. I accordingly changed them for an "elixir" of the gland (Messrs. Allen and Hanbury's), and heard nothing more of the case for about 10 days, when I learnt that the patient was seriously ill with typhlitis. It is fair to say, however, that her doctor did not ascribe her attack to the thyroid treatment, but to some nuts which she had been eating.

A second private case derived, in two months, absolutely no benefit from the tabloids.

I cannot say the same, however, in regard to two cases of advanced nodular leprosy—curious as it may seem. Of course I do not suppose that the ingestion of thyroid gland is going to have any real curative effect in that disease; but I must admit that both the patients expressed themselves as feeling much better since taking the tabloids, and the treatment was certainly followed by a rapid diminution of certain febrile attacks accompanied with those acute localised erysipelatous œdemas which are not uncommon in such cases.

I may here mention that in prescribing thyroid gland I have been careful to say nothing to lead the patients to suppose that they were going to take something new or marvellous; the tabloids were given as ordinary medicine, and I do not think that

* I am indebted to Mr. Walter Tay for allowing me to mention these cases.

† My thanks are similarly due to Mr. Bidwell.

the information given by the patients on subsequent visits was more than ordinarily coloured by "suggestion" or anything of that sort!

The usual dose was 3 tabloids *per diem*, generally 1 after each meal, or 2 in the morning and 1 in the evening, and, if unpleasant symptoms ensued, they were reduced to 2 or to 1 in the 24 hours. In a few instances, 4 or even 6 tabloids were administered during the day. In cases in which the remedy appeared to do good, I found it made little or no difference whether the tabloids were taken on an empty stomach or after meals; as a rule, the patients seemed to prefer them after meals. There was less nausea produced, in a few cases, if the tabloids were crushed and swallowed with a little milk.

I shall now give short extracts from the case-books of the patients attending the hospitals mentioned above.

Psoriasis Cases.

1. J. S., *f.*, 13. Psoriasis, one year. Had been under tar treatment for four months with much benefit, only a few patches remaining. Commenced thyroid August 24. The note on September 14 is "much better, but complaining of headache." On October 19, "all the spots are practically gone."

2. A. B., *f.*, 15. Psoriasis. Commenced thyroid August 31, while rapidly improving under tar treatment, which was still continued. There was distinct improvement in the first fortnight, but bad headaches came on. On October 5 "the spots nearly all gone, but headache very bad." October 25 having taking only i; eruption better; headache gone; ordered ii. November 16, same report.

3. M. C., *f.*, 43. Psoriasis, extensive, since 6 or 7 years old; neurotic, and has had syphilis. Commenced thyroid September 10, together with ung. and lot. September 16, "improved *re* eruption, but complains of giddiness." On the 23rd, "eruption undoubtedly much improved, in fact many places disappearing, she says, quicker than ever before, but medicine makes her extremely weak, with muscular tremors, palpitation, &c., and has had to leave employment." The tabloids were left off, and commenced again on October 7. Persistent trembling again came on, with only 1 *per diem*. She has since been using ung. creol. c. sap. co., and lot., with steady improvement.

4. J. H., *f.*, 21. Psoriasis, four months. Commenced thyroid November 15. Numerous fresh places appeared in first week, and bad headache. Reduced tabloids to 2 *per diem*; steady improvement noted up to December 27.

5. M. C., *f.*, 10. Psoriasis, very extensive and universal limpet-shell eruption, began on scalp eight months ago and then pervaded whole body and limbs. Child very emaciated and sickly for six years. Has been under tar treatment since July, with improvement. The thyroid was commenced in the middle of August, with marked improvement

noted after two weeks. This continued to November 9; since when patient has not been seen.

6. G. P., *m.*, 54. Psoriasis. Forearms, hands, and legs, three weeks; his first attack; takes much beer and meat; has had rheumatic gout. Commenced thyroid September 19 (and tar lotion). Improvement was rapid and well marked up to the end of October; but patient complained of muscular tremors and "nervous feelings."

7. G. D., *m.*, 42. Psoriasis, very severe and extensive for 20 years on and off; very itchy; patient gouty; mother and sisters affected. Commenced thyroid August 31; the note on the following week, September 7, was "much better, scales all desquamated." Patient has not been seen since.

8. S. B., *f.*, 12. Psoriasis extensive, treated for 18 months at a large hospital. Had been improved since July with tar ung. and baths. Commenced thyroid August 14. On August 28 there was very little change; but the note on September 11 is "much improvement," which continued till October 16, when it seemed *in statu quo*. She then resumed the tar ung. in addition to the thyroid, with marked improvement up to the present.

9. K. B., *f.*, 29. Psoriasis, five months, since suckling a baby; but first attacked when 15. Commenced thyroid October 20 (with tar lotion). Nov. 6, "Patches rather better, but could only take the tabloids four days in consequence of headache and dizziness." Ordered ii *per diem*, and an ointment for the scalp. November 20, "eruption better," and on December 6 the note was "still better and scalp cured."

10. C. A., *f.*, 35. Psoriasis, nine years, since birth of first baby; general health poor; a brother affected. Commenced thyroid August 16 (also using ung. and lot.), and this treatment continued till December 11, when the note is "spots still there, but many have disappeared."

11. A. P., *m.*, 26. Psoriasis one year; a brother affected. Commenced thyroid on September 28, and has not since come to hospital.

12. L. C., *f.*, 35. Psoriasis five years; health good; a brother affected. Commenced thyroid August 17, and using ung. There was little or no improvement, but from time to time she complained of weakness and palpitations. On December 13 some fresh spots had appeared.

13. W. R., *m.*, 33. Psoriasis. Commenced thyroid September 7 (with lotion). Distinct change was observed in a week, but he thinks the medicine makes him feel nervous. The tabloids were ordered again and the patient has not since reappeared.

14. Z. G., *f.*, 45. Psoriasis. Commenced thyroid August 10 (with ung. and lot.). Distinct improvement was noted on September 7, and this was maintained up to October 25, but eruption not then gone. The patient has not been seen since.

15. W. T., *m.*, 16. Psoriasis. Commenced thyroid October 19. On November 1 the spots seemed spreading on the forehead but more scaly, and some dying away on the chest. Bad headache. November 9, "some improvement, but a new patch on thigh, and scalp still thick with it." (Ordered ung. for latter.) November 23, "better, especially on the head." December 7, "much improved, but using ung. for all places." December 21, "nearly all disappeared."

16. H. L., *m.*, 33. Psoriasis, four months. Commenced thyroid October 7 (also ung. and lot.). On October 14 "spots slightly better, but complained of severe headache." There was gradual improvement till November 25. He then took the tabloids only for a week, with slight

increase of the spots, and he became so very "nervous" that he left off taking them. He has since used ointment and lotion with benefit.

17. J. W., *m.*, 38. Psoriasis, severe and itchy. On and off since youth. Commenced thyroid on October 19, and has not been seen since.

18. H. H., *f.*, 16. Psoriasis, extensive and universal, for two years; itchy; health good. Commenced thyroid October 20; but as eruption continued to appear in fresh places, they were left off November 22. With ung. creol. c. sap. co. and tar baths, and no internal treatment it has been rapidly disappearing; and on December 27 the scalp, body, and limbs were nearly quite clear.

19. L. T., *f.*, 16. Psoriasis, two years. Two girls have it in same school. Commenced thyroid November 6. On November 20 "some spots disappearing." November 27, "fresh ones have appeared; so ordered ung. in addition." December 4, eruption improved, but bad headaches, therefore left off tabloids. There has been steady improvement since with external treatment.

20. M. D., *f.*, 33. Psoriasis nine years, commenced when nursing first baby; very extensive and itchy. Commenced thyroid September 28 (with lotion). October 5, no change; bad morning headache, and diarrhœa," ordered only i *per diem*. October 12 "eruption rather better, but more irritable." The tabloids have been continued, ii *per diem*, until the present time, and only now the spots seem to be fading.

21. H. S., *m.*, 54. Psoriasis, 18 months; first attack nine years ago; itchy. Commenced thyroid September 5. Not much improvement on September 19, but no fresh spots. Patient has not been seen since.

22. M. O'H., *f.*, 16. Psoriasis since seven years old. Father affected. Commenced thyroid August 14 (with ung. and lot.). On September 21 no great change, some new spots had appeared. October 19, "has left off tabloids as they gave her headaches."

23. M. R., *f*, 11. Psoriasis; father affected. Commenced thyroid August 8 (with ung.). Much improvement was noted in a week, but not much change afterwards up to September 26; since when the child has not been seen.

24. J. G., *m.*, 29. Psoriasis since 5 years old. Commenced thyroid November 16 (with lot.). On November 30 the patches looked better and were scaling off. December 14. Some of the older ones had improved, but there were numerous fresh spots. Ordered ung. and tar bath. December 21, "much improvement," maintained till the present time.

25. G. K., *m.*, 16. Four years. Commenced thyroid December 4. Fresh spots kept appearing till December 27, when ordered ung. and to leave off tabloids. January 3, "much better since using only the ointment."

26. E. G., *f.*, 19. Psoriasis two years; itchy; patient out of health; father affected. Commenced thyroid December 14. On the 18th fresh spots had appeared, and no change in the old ones. December 27, rather better and no new ones. Has had neuralgia this week. January 4, eruption certainly better.

27. H. S., *m.*, 50. Psoriasis for four years every spring. Has been much improving under tar treatment. Commenced thyroid October 10, but left off in a week, as he complained of neuralgic pains in shoulder since taking them.

28. A. M., *f.*, 17. Psoriasis; first attack when 11. Commenced tabloids September 26 (together with ung. and lot.). October 3, "has much

increased since last week." October 24, "slightly better." Has not since come to hospital.

29. A. E., *f.*, 74. Psoriasis for 39 years; first appeared after seventh confinement. Commenced tabloids August 11 (also using ung. and lot.). October 17, "improved." November 7, "rather better, but has lost power in arm." Has not since come to the hospital.

30. G. S., *m.*, 15. Psoriasis, three months. Commenced tabloids September 26 (also using ung. and lot.). October 17, "improved." October 31, "has been feeling languid last two weeks; patches much better; one small new one." November 17, "improving, only taking one." December 12, "some fresh spots coming out, old ones nearly gone."

31. R. N., *m.*, 21. Psoriasis, two months. Commenced tabloids September 17 (also using ung. and lot.). October 17, "spots disappearing." November 28, "improving." Patient not seen since.

32. W. McI., *m.*, 30. Psoriasis since 10 years old; father affected. Commenced tabloids September 26 (also using ung. and lot.). October 13, no note taken, and has not been seen since.

33. E. T., *f.*, 22. Psoriasis, very extensive; first attack at 7 years old; a sister affected. Commenced tabloids November 28. Has only been since seen on December 1, and no note then taken.

34. J. E., *m.*, 33. Psoriasis, 18 months; very extensive. Commenced tabloids November 11. On November 28, "improving." December 12, "not much difference, one new spot."

35. F. R., *f.*, 41. Psoriasis, 2nd attack. Commenced tabloids November 11 (also ung. and lot.). On November 24 "eruption better." December 12. "still improving."

36. A. K., *f.*, 25. Psoriasis, off and on 12 years; maternal aunt affected. Commenced tabloids November 7 (also ung. and lot.). November 21, "no improvement." December 19, "much better."

37. A. T., *f.*, 26. Psoriasis, commenced when 16; nervous temperament. Commenced tabloids September 26. On October 31, "much better;" November 28, "not much difference."

38. E. M., *m.*, 11. Psoriasis, since 5 years old; ? phthisical; mother affected. Commenced tabloids October 27 (with ung. and lot.). Has continued till December 15, but no notes taken.

39. M. S., *f.*, 15. Psoriasis, 2 months. Commenced tabloids October 27 (with lotion); November 10, "better—suffers from headache;" December 22, "better."

40. C. P., *m.*, 54. Psoriasis, since youth; severe; hypertrophic papillary growth on both legs. Much scarred with old syphilis. Commenced tabloids November 26 (together with ung. and lot.); October 3, "improved;" October 17, "much improvement;" December 5, "improved;" January 2, 1894, "much better, psoriasis nearly gone, and papillary growth greatly diminished."

41. J. C., *m.*, 16. Psoriasis, since infancy. Commenced tabloids September 26; on October 3, "improved;" October 24, "not much difference"—ordered ointment; November 14, "gone since using ung."

42. J. W., *f.*, 10. Psoriasis, for three years; extensive and thick crusts. Commenced tabloids October 27, ii *per diem*. December 19, "slightly better."

43. E. I., *f.*, 51. Psoriasis, since 7 years old, extensive. Commenced tabloids September 27 (with ung. and lot.). October 10, "improved—but pains in limbs;" October 24, "distinct improvement;" November 3, "much better;" December 12, "ditto."

44. J. D., *m.*, 26. Psoriasis. Has had much seborrhœa of scalp. Commenced tabloids October 24. On October 31, "patches redder, but no particular change;" November 7, "no change"—ordered ung. for scalp; December 19, "no better on body and limbs."

45. A. H., *f.*, 16. Psoriasis, three years; not very healthy; mother's family affected. Commenced tabloids October 21. On November 3, "not much difference"—ordered ointment; December 1, "eruption certainly better;" December 15, "improving."

46. F. H., *f.*, 18. Psoriasis, four years; itchy. Commenced tabloids October 10 (with lotion). On the 21st ordered ointment in addition; November 7, "much better;" November 27, "still improving;" December 29, "nearly cured."

47. E. S., *f.*, 38. Psoriasis, first attack when 20. Commenced tabloids October 10. On October 20 "better;" Nov. 10, "much better"—(also using ung.); December 8, "doing well;" December 22, "ditto."

48. F. F., *f.*, 11. Psoriasis, five years. Commenced tabloids October 21. No note taken till December 1, "better;" December 8, "ditto."

49. F. D., *m.*, 38. Psoriasis, extensive and severe for many years, disappeared last year, but recently out as bad as ever. Commenced tabloids October 20 (with lotion); and subsequently ordered ointment. Has not appeared since November 18.

50. A. L., *f.*, 13. Psoriasis, since early infancy. Commenced tabloids August 11 (with ung. and lot.); August 18, "improved," and patient has not been seen since.

51. E. A., *f.*, 39. Psoriasis, five years; poor health. Commenced tabloids October 6, had been under ordinary treatment since May; October 27, "patches increased"—ordered ung. and lot.; November 24, no note taken, and not been seen since.

52. H. R., *f.*, 32. Psoriasis, came after a confinement. Commenced tabloids September 26 (with ung. and lot.); on October 3 "better;" October 10, "ditto;" November 7, "slightly better;" December 19, "no better."

53. R. T., *f.*, 39. Psoriasis, seven years off and on; first came after a confinement; very extensive and itchy; nervous temperament. Commenced tabloids September 26 (with ung. and bal.). October 17, "improving." Did not come to hospital again till December 29, with the eruption getting bad again.

54. C. P., *m.*, 9. Psoriasis, chiefly confined to palms and soles, and very slight on elbows and knees. Had similar attack and on same situations five years ago, and cured here in two months. Commenced tabloids November 28 (ii *per diem*); December 5, "distinct improvement—but tabloids make him sick;" December 19, "eruption nearly gone, but still feels sick after lozenges;" January 2, "quite cured—lately lozenges have not upset him." There was no desquamation from the palms and soles; the thickened hard epidermis gradually became soft and normal.

55. F. G., *f.*, 18. Psoriasis, one month, very extensive; first attack when 8 years old. Mother's family affected. Commenced tabloids November 28; on December 12 "much improvement—scaling off;" January 2, "still improvement on body and limbs, but bad on scalp."

56. M. B., *f.*, 37. Psoriasis. Commenced tabloids December 1; on December 8 the note is "tabloids make her sick." She has not been seen since.

57. A. P., *f.*, 16. Psoriasis, one month; a brother affected. Commenced tabloids November 11; on the 21st "going from arms, but coming

more on legs;" December 5, "medicine makes her feel sick and very sleepy"—ordered tar bath; December 19, "arms better, but spreading elsewhere;" January 2, 1894, "nose has been bleeding very much; arms much better but fresh spots on legs."

58. R. B., *f.*, 22. Psoriasis, since 5 years old. Commenced tabloids September 27; on October 3, "improved;" October 24, "ditto, except on scalp"—ordered ointment. The improvement continued till November 28; on January 2, 1894, she came with "numerous fresh spots."

59. H. S., *f.*, 17. Psoriasis, since 7 years old. Commenced tabloids December 22; on January 5, 1894, "spots much increased on face and arms."

60. G. M., *f.*, 16. Psoriasis, a few months, since working at a butcher's; eating more meat than formerly; very itchy. Commenced tabloids September 1; continued till September 29, "practically no change." Then ordered only ung. creol. c. sap. co. and lot. creol. October 6, "better;" and improvement maintained ever since.

61. J. N., *m.*, 9. Psoriasis. Had been under treatment with arsenic and chrysophanic since June. Commenced tabloids October 6; fresh spots continued to appear till October 27, when ordered ung. and lot. creol., and has been improving since.

62. S. W., *m.*, 20. Psoriasis. Extensively developed in six weeks. Health otherwise good. Commenced tabloids September 8. On September 15, "says scales have been coming off more, but eruption just as irritable. No new spots; had headache and pains yesterday"—ordered, in addition, lot. carb. det. September 28, "eruption less irritable, but not much change"—to use ung. carb. det. October 6, "much improvement," which continued till October 27, when patient ceased to come.

63. R. W., *f.*, 13. Psoriasis, one year. Commenced tabloids October 20 (together with lotion). On the 27th "improved." November 3, "bad headaches, spots slightly better." November 24, "not much improvement." Since then she has left off the tabloids, and has used ointment, with steady improvement.

64. S. T., *f.*, 8. Psoriasis, two years. Commenced tabloids November 24. On December 1 the note is "spots coming out more," and on December 15 "still increasing." She was then treated only with ointment and lotion, under which she has been rapidly improving.

65. E. K., *f.*, 20. Psoriasis, two years. Commenced tabloids October 13. On October 20 the eruption was much better, and also on November 3; on November 24 there seemed little change; she has since been using ointment and lotion with distinct benefit.

Lichen Planus Cases.

66. C. S., *f.*, 36. Lichen planus. Confluent spots on left knee for four years. Commenced tabloids September 18 (also using lot. creol.); September 25, "improved;" and gradual improvement up to October 31, when ointment was also ordered.

67. C. L., *f.*, 32. Lichen planus. Commenced August 10 (also using ung. and lot.); August 17, "marked improvement, but tabloids make her feel sick;" August 31, "nearly all gone—now takes tabloids after meals and feels no sickness." She has not presented herself at the hospital since this date.

68. A. S., *f.*, 66. Lichen planus, two months. Commenced tabloids November 28; on December 5 "has been ill and constipated since taking the tabloids, and eruption worse." Has not been seen since.

69. E. W., *f.*, 37. Lichen planus. Treated here for it and cured in 1884. Commenced tabloids October 27 (also ung. and lot.); November 3, "slightly more irritable;" December 8, "eruption diminishing, but lozenges cause palpitation." Not come to hospital since.

70. E. H., *f.*, 38. Lichen planus. Commenced tabloids August 18, although improving with tar treatment. October 10, "tabloids make her sick;" October 20, no note taken, and has not been seen since.

Eczema Cases.

71. A. V., *m.*, 42. Eczema palmaris 15 years; severe on hands, and some eruption also on forearms and legs. Commenced tabloids September 7 (together with ung. creol. co.); on September 14, "improved, except one patch on leg;" September 21, "still improvement;" October 15, "better." The treatment was continued till November 23, with certainly great amelioration of the disease.

72. A. H., *f.*, 68. Eczema rubrum, leg. Commenced tabloids September 18; on October 2, "very slight change in the leg, perhaps a little less inflamed; says she feels better in health;" began to use ung. and lot.; October 9, left off tabloids; November 6, "says does not sleep so well since leaving off lozenges," therefore recommenced. December 11, "certainly better;" December 18, "ditto."

73. F. C., *m.*, 45. Eczema, leg and face. Took tabloids for one week in September. No result.

74. W. D., 45. Eczema seborrhœicum, severe on arms, hands, and scalp, five months. Took tabloids for two weeks in September (also using ointment) with slight improvement; complained of palpitation and would take no more.

75. L. B., *f.*, 50, eczema. Commenced tabloids September 6; on September 19, "not much difference, but complains of severe pains across loins;" has not appeared at hospital since.

76. B. C., *f.*, 11. Eczema since three years old, very severe on scalp, bends of joints, &c.; child plump and well nourished, and generally healthy. Commenced tabloids September 26 (with ung. and lot.); October 3, "no improvement;" October 17, "somewhat better;" November 17, "certainly better;" November 28, "much better;" December 12, "still improving;" December 29, "marked improvement."

77. E. M., *f.*, 77. Eczema, severe on arms, hands, and face. Under treatment since July 7. Commenced tabloids September 7 (with ung. and lot. creol.); on September 15 "much improved;" September 22, "arms have got bad again, and tabloids make her very sick." Since then has been using ung. and lot. and a ferruginous aperient, with improvement.

Urticaria Cases.

78. J. P., *m.*, 63. Urticaria, chronic and severe, for one year. Commenced tabloids August 10, and continued them till August 24; the urticaria immediately increased, and steadily became worse while taking them.

79. M. S., *f.*, '48. Chronic urticaria, one year. Commenced tabloids August 31 (with tar bath); has not appeared since at the hospital.

Lupus Cases.

80. E. F., *f.*, 52. Commenced taking thyroid September 5, but left it off on October 5, in consequence of the indigestion they caused. There

certainly seemed considerable improvement in the face, but she was using an ointment at the same time.

81. A. B., *f.*, 55. Extensive non-ulcerative lupus of the face, two years, with much congestion and œdema. Commenced tabloids September 7 (with ointment). There has been marked improvement ever since, and she is still under the same treatment, December 20.

82. M. O., *f.*, 25. Lupus, three years. Commenced tabloids September 21, and continued till November 2; there was no change in the lupus, but she complained of pains in the chest.

83. E. T., *m.*, 18. Lupus, extensive, of face; had derived temporary benefit from tuberculin, and apparently been kept under by salicylic and carbolic ointment. Commenced tabloids, in addition to ung., August 11. Has continued up to October 24, but no definite note taken.

Miscellaneous Cases.

84. J. A., *f.*, 26. Acne rosacea, and what is said to be "lupus exfoliativus" on the popliteal space of one leg. Commenced tabloids September 7. On September 14, "says tabloids made her very ill, with diarrhœa pains in the stomach, and face swelled.' She continued them until September 25, tabloids still disagreeing, and with no local improvement.

85. C. G., *m.*, 63. Prurigo senilis. Patient greatly emaciated. Commenced tabloids August 31; on September 7 "itching rather worse," and says he feels exhausted; September 13, "irritation worse." He then left them off.

86. E. S., *f.*, 27. An anomalous papular eruption, superficially resembling adenoma sebaceum, of two years and a half duration. Commenced the tabloids September 6, and continued them in a rather desultory way until December. There has been distinct improvement, but she has also been taking cod-liver oil, and using occasional external applications.

The results, as indicated by these Hospital Notes, may be thus briefly summarised.

The tabloids were administered in 65 cases of psoriasis, 5 of lichen planus, 7 of eczema, 2 of chronic urticaria, 5 of lupus, 1 of prurigo senilis, and in one of a peculiar papular eruption, which superficially simulates adenoma sebaceum.

Of the psoriasis cases, 17 may be discarded as being under treatment or observation for too short a time. Taking the remaining 48, some definite improvement was noted in 18, but only 7 of these latter were under treatment with thyroid gland alone; the others used in addition external tar applications. In 16 the result, as regards the eruption, was practically negative; and in 15 there was an actual increase of the eruption during the exhibition of the remedy.

In 28 of the patients disagreeable symptoms were complained of, such as headaches, palpitations, muscular tremors, neuralgic pains, dyspepsia, &c.

Of the five cases of lichen planus, there was marked improve-

ment in three, but these also were using external remedies at the same time. Three of them complained of disagreeable symptoms.

Of the seven eczema cases, three, I believe, derived benefit from the thyroid, but they, also, were under simultaneous external treatment. Unpleasant symptoms were present in three. Neither of the two cases of chronic urticaria derived the slightest benefit; the trouble, indeed, was rather increased.

The case of prurigo senilis also derived no benefit from taking the tabloids; but the anomalous papular eruption certainly began to diminish since the patient commenced with the tabloids; but she had also been taking cod-liver oil, and sometimes using external applications. Two of the lupus cases showed some improvement, but both of them were at the same time using external applications. Three complained of disagreeable effects.

It is obvious that my enquiry would have been more conclusive if all other medication had been discontinued while the patients were being treated with the thyroid gland. But experiments on patients—especially out-patients—cannot always be carried on with a free hand. The fact is, many of the above cases were already—when I commenced to order the thyroid—deriving benefit from ointments or lotions, which they did not desire to leave off; in others, the external applications were prescribed after futile treatment for a fortnight or so with the gland alone; or in a few cases where there was special indication for some antipruritic application. Forty-six of the total number, however, were, for some time at least, treated only by the administration of thyroid gland.

I am quite aware, indeed, that these observations are very fragmentary and imperfect. To carry out a therapeutical enquiry of the kind in a thoroughly scientific manner, it seems to me that the patients should be kept in hospital under constant observation and record of physical phenomena, and with frequent examinations of the secretions, and, I would suggest also, of the blood. But faulty as my communication may be, I hope that it will prove of some little practical interest to practitioners who are contemplating a trial of the administration of thyroid gland in diseases of the skin.

The conclusions that I think may be deduced from my observations, as well as from those of others, so far, are as follow :—

(1.) The ingestion of thyroid gland, although of specific therapeutical value in myxœdema and sporadic cretinism, has no constant effect in psoriasis, and in many other diseases of the skin.

(2.) In a large number of cases the results are negative; and in a few the cutaneous lesions are aggravated.

(3.) In a certain number—a minority—there is a distinct and marked curative effect.

(4.) At the present time we have no prior indications as to which cases its administration is likely to benefit.

(5.) In a considerable number of the patients disagreeable constitutional effects are induced.

(6.) Age and sex have nothing to do with the success of the remedy.

For my part, I do not intend in future to prescribe thyroid gland promiscuously to all patients with diseases of the skin; but I shall certainly try it again in cases which "hang fire" under the usual methods of treatment, as well as in those in which its use may be physiologically indicated. Although the results of the treatment may not as yet come up to expectations, yet I think that we are greatly indebted to Dr. Byron Bramwell for having suggested its use in ordinary cutaneous medicine, and for having further developed in a therapeutical direction the brilliant researches scientifically initiated by Mr. Victor Horsley, and so successfully continued by Dr. George Murray and others on the relation between the thyroid gland and nutrition.

Dr. F. de H. Hall (the Vice-President, in the Chair) observed that, *a priori*, one would be apt to expect that the thyroid treatment would have some kind of effect in skin affection, especially those of a squamous type, in view of the wonderful effect which the medicine had in softening and moistening the dry skin of myxœdema. He asked the strength of the tabloids employed. He himself gave one thyroid gland weekly in a case of myxœdema, and this proved sufficient to keep the patient in good health. He had several times discontinued the treatment, but the symptoms invariably recurred. No patient had ever complained of the thyroid being disagreeable to take.

Dr. Morgan Dockrell said the paper would have been of greater value had the author abstained from employing any other form of treatment while giving thyroid. He himself had carried out a series of observations with thyroid in the treatment of skin diseases, but had been careful not to use any external application at the same time. The author had pointed out that beneficial results could be obtained by tarry applications alone, so that the use of such preparations vitiated the experiments

with thyroid. Personally he had observed some bad effects of the thyroid treatment. He would point out that seborrhœal dermatitis was often mistaken for psoriasis, and described as such, and it was quite likely that the extract had been given in that condition without result. Good results were obtained in some cases, while in others no results or bad results followed. He had given thyroid in about 60 cases, and in none had there been any increase in the eruption. Hebra had laid it down that psoriasis was a disease of the robust, but it was often met with in people who could not be described as robust. In his own experience it was more often in the debilitated that thyroid proved of service against psoriasis, and in children more than in adults. The best result obtained was in the case of a lecturer on temperance, himself a total abstainer. He got well very rapidly. In another case a man got well within six weeks, but he had since come again under observation with a recurrence. He usually began treatment with children by giving half a tabloid at a dose, increasing the dose in about a fortnight to a whole tabloid. In adults one might safely give six or as many as nine tabloids daily without untoward effects, but one sometimes had to stop them on account of the great debility which their use produced. He therefore usually gave a tonic of some kind at the same time. The administration of thyroid extract generally gave rise, at first, to debility, and often to a rise of temperature. With one tabloid the temperature would sometimes go up as much as 2° at night. The thyroid treatment was somewhat disappointing, as it was hoped that its use would do away with the abominable messes now necessary for external application

Dr. Eddowes said he had used thyroid extract in cases of skin disease, and the symptoms had been sometimes very unpleasant, so much so that the remedy had to be abandoned. In some instances he had given it for a time alone, and had then tried local applications, in addition, to certain parts. The parts treated in the latter manner progressed far faster than the rest, and then the local treatment was extended to all portions of the body requiring it. He agreed that many cases of seborrhœic eczema were described as psoriasis, and he mentioned that in the museum of the Hôpital St. Louis, in Paris, there was a model labelled "Psoriasis figure," which was probably a case of seborrhœic eczema. He pointed out that even severe universal symptoms would sometimes improve greatly, or entirely disappear in a few weeks under tar, salicylic acid, sulphur, &c. He had been unable to obtain any definite indication as to which cases were likely to be benefited by the thyroid treatment. As his experience increased he felt less disposed to try thyroid at the outset.

Mr. Anderson referred to a case in which a pure treatment by thyroid extract had been carried out, all local applications being suspended. It was a typical case of psoriasis in a man aged 35, and he could affirm with confidence that it was not an example of seborrhœal eczema. It dated back 30 years. From time to time it yielded either spontaneously or under the influence of one or other remedy. He thought the temporary disappearance was probably spontaneous, because the treatment which had appeared to determine the subsidence on one occasion proved absolutely inert in later attacks. The patient came three months ago to St. Thomas's Hospital with psoriasis, covering nearly the whole of the body, but was otherwise quite healthy. No local treatment was ordered, but he was put on 3 grains of the extract three times a day—a dose that could not be increased without unpleasant results. This treatment was continued for three weeks, and on each occasion of coming to the hospital he

was somewhat worse than before. At the end of this time the extract was replaced by local applications, and he was improving rapidly. This was evidently a case in which the remedy not only did no good but appeared to be positively harmful.

Dr. Hingston Fox, alluding to the author's observation that the effects of thyroid gland were neither positive nor constant, pointed out that the want of constancy in the results might be due to a want of constancy in the glands themselves. He had made some observations on this subject, and had satisfied himself that the thyroid glands of sheep varied much, both in size and appearance. It was impossible to affirm that one gland was the equivalent of another, or even that equal weights of two differing glands were equivalent in potency. Then, too, the thyroid gland in the human subject was known to often undergo enlargement at certain periods —menstruation and pregnancy—and it was quite likely that the gland in the sheep underwent changes at corresponding periods. They knew very little as to the nature of the changes that took place in the gland, and it was quite possible that the discrepancies observed by different investigators in using the gland might be explained by these ill-understood changes. It could only be when chemists had isolated and defined the principles in virtue of which the gland exercised its therapeutical effects, that they could be sure they were using standardised equivalents of the gland substance. Until then their experiments must necessarily be of a rough character, and must remain open to many fallacies and discrepancies.

Dr. Abraham, in reply, said the tabloids employed by him were made by Messrs. Burroughs, Wellcome, & Co., and were 5 grains each of the dried gland. They were supposed to represent one-eighth part of a normal sheep's gland. He agreed with the last speaker that there was probably considerable variation in the quality and the size of the gland ; but in an inquiry of this sort one was obliged to make use of such material as was available, and as the tabloids seemed to be the most convenient form he had chosen them. He admitted that they might differ materially in activity, but he pointed out that some of the cases were treated from the same supply of tabloids, so that some uniformity might be assumed. There were, of course, many points upon which he had not touched, and as to which much still remained to be learned. He remarked on the fact that the effect of the remedy was the same, whether given on an empty stomach or after a meal, showing that the active principle, whatever it might be, was not digested in the stomach. He claimed that he could distinguish a case of psoriasis from one of seborrhœal eczema ; in the whole series only one case of the latter affection had submitted to the treatment. He had expressly referred to seven among the 18 successful cases of psoriasis in which no other form of treatment had been employed while the thyroid extract was being given, but in a good many other cases—about 46 of the total 86—the patients had begun with the gland treatment alone, and only in the absence of good results most of them had been driven to use other remedies. He had gone very carefully into the matter of age as it regarded the effects of the drug, but had been quite unable to make out anything ; and the same applied to sex. Among the cases in which the thyroid did good, some were old and some were young. Among his best cases were those of a man aged 54, and others still older.

January 29th, February 12th and 26th, 1894.

THE LETTSOMIAN LECTURES: ON PERITONITIS.

By Frederick Treves, F.R.C.S.

LECTURE I.

The Nature of Peritonitis.

I have ventured to select peritonitis as the subject of these lectures, not only on account of the fact that the diseased conditions known by that name still occupy a terrible prominence among the causes of death, but because the present time appears to be peculiarly convenient for reviewing the clinical and pathological aspects of this fatal trouble, and for criticising opinions, which the custom of years has endued with a spurious appearance of accuracy.

The Nature of Peritonitis.—By peritonitis is understood an inflammation of the peritoneum. From the limited standpoint of morbid anatomy no exception can be taken to this definition, but when it is assumed that the various clinical phenomena which are classed together under the title of "peritonitis" are due, either solely or in the main, to an inflammation of the great serous membrane, then the definition becomes, to some extent, misleading.

It may almost be said that peritonitis, clinically as well as pathologically, has comparatively little to do with inflammation of the peritoneum, and it would be erroneous to state that the majority of those who die of what is called peritonitis die of a peritoneal inflammation.

In order that this very fundamental matter may be fully discussed, it is necessary that two questions should be considered. The first concerns itself with the general nature of inflammation, and the second with the relation peritonitis bears to that process.

(1) *The Purpose of Inflammation.*—If one may judge from the terms and expressions which are in common use respecting inflammation, and if deductions may be drawn from those ready criticisms of the process which are uttered without fear of scientific

cavillings, then inflammation is still the dread thing it was many centuries ago, when phlegmon was a ruthless fetish, and when the anti-phlogistic regimen was the only means of propitiation. Inflammation is still referred to as a calamity, as a thing that is violent, as an utter evil, and as an ill wind that can blow no other than ill. It is spoken of as "breaking out," and made comparable with a riot which lays waste a peaceful city. It is often said that the patient "did well until inflammation set in," or that "his progress towards recovery was cut short by a fatal attack of inflammation."

The treatment which should be directed against this evil is commonly assumed to be of the same heroic type as are the drastic measures which may be taken to arrest the progress of fire and pestilence. Inflammation was represented in the literature of the past as the great enemy of mankind, and even in the popular science of the present it retains no little of its satanic disposition.

This view of the inflammatory process needs to be amended, and a very brief survey of some examples of the process should quite justify such amendment. A man, let it be supposed, receives a lacerated wound of the hand in dissecting the body of a patient who has died of puerperal fever. He becomes thereby inoculated at the wounded point with what is practically a culture of pus-producing cocci.

Now, as the human body is an excellent medium for the cultivation of bacteria, the micro-organisms begin forthwith to settle down and multiply. But here steps in the process of inflammation. Under its ægis the cells of the body rise in their millions against the invaders, and there takes place at the point of the outbreak a battle which—if the account of Metchnikoff and others is to be accepted—is without a parallel in the very deadliest warfare imagined by man.

It is by the inflammatory process that the poison is destroyed and the growth of the parasite is arrested.

But for inflammation a man who is accidentally inoculated with a septic micro-organism becomes at once little more than a test-tube, prepared for the favourable development and culture of the particular coccus or bacterium. In malignant pustule can be well seen the desperate struggle which takes place in the tissues between the invading bacillus and the aroused and active cells of the body. This conflict is a representation of the inflammatory

process, and the beneficent purpose of the change is splendidly obvious. But for this inflammation, which has been so much condemned, a human being may be regarded as an organism not far raised above the level of a peculiarly shaped mass of intelligent agar agar.

In a case of tuberculous phthisis it is generally assumed that a destructive inflammation of the lung is the chief cause leading to the patient's death. It is not the inflammation which is to blame, but the bacillus which has caused it. How long it would take for the non-resisting lung to become wholly occupied by this particular bacterium it is impossible to say, but it is safe to assert that the inflammation of the lung prolongs the infected man's life, and that his prospects of improvement and recovery depend almost wholly upon it. How many lives and limbs have been saved for a reasonable span by that process in a joint called tuberculous disease, a process which, after many centuries of unjust ignominy, is now servilely imitated by the surgeon in his operation of arthrectomy. In the familiar "white swelling" is represented the often successful attempt of the organism to rid itself of the tubercle bacillus by means of the inflammatory process. In this, as in other invasions, the enemy is not repelled without loss, but it is the loss of a part as against the loss of the whole.

Inflammation is distinctly *not* a malignant energy working only for evil. It is a process with a purpose, and that a beneficent one. Its object is protective, and its end is shown by the freeing of the body of noxious organisms which lead to death, and upon which may well be bestowed the anathemas lavished on what is, in its primary purpose, a curative process.

The philanthropic busybody who, after contemplating the death-roll ascribed to inflammations of the lung and brain and kidney, could succeed in ridding the earth of the process of inflammation, would see a result which hardly a pessimist could regard as kindly. It may be assumed that within a month or so of the disappearance of inflammation from the business of the body the human race would become extinct.

That inflammation may be excessive in individual cases, that it may be attended by certain disasters, and that it may fail to some degree in its purpose, are evident facts. It is also clear that the process of inflammation may be assisted and modified by treatment, especially if it be in the direction of removing from the tissues

those irritants which have not only caused but have maintained the inflamed state. Treatment having for its object the abrupt arrest of inflammation and the vigorous stamping out of its manifestations has not been attended with conspicuous success.

What has been said of inflammation in general applies equally to inflammation within the great serous cavity of the abdomen. Peritoneal inflammation is not a purposeless calamity. That which has caused it is the thing which is wholly ill. It is by the process of inflammation that the advance of certain deadly irritants, which have gained access to the cavity, can be arrested. The purpose of peritonitis is towards the saving of life and not towards the destruction of it. What is seen within the abdomen at the autopsy on a case of peritonitis represents the results of an attempt on the part of the organism to avert a too potent cause of death. It does not represent, as is too commonly assumed, the reckless and fanatical destruction wrought by a wholly evil-tending process.

(2) *The Relation of Peritonitis to the Inflammatory Process.*—In the larger proportion of examples of fatal peritonitis the leading symptoms are those of poisoning and not of inflammation, and death is due rather to toxæmia than to inflammation of the serous membrane. This view of the subject was advanced by Wegner* nearly 20 years ago.

There is about the patient who is dying of peritonitis every suggestion of a poisoned man. He lies back in bed prostrate, with gaunt cheeks and sunken eyes. There is a look of unceasing anxiousness in his face, and a sense of hopeless unquiet in his movements. The hands, which wander with pathetic restlessness over the bed-clothes, are cold and damp. The tongue is that of a man who is dying of thirst. There is constant vomiting. The breathing is laboured, and accompanied with faint sighs and groans, and the countenance is ashen and livid. Such a picture makes a reality of the metaphor of "the shadow of death." So far as the aspect of the patient goes, he might be dying from snake bite or from the poison of cholera, while there is little to suggest an inflammation so intense as to be ending fatally in a few distressful days.

When the patient dies and the abdomen is opened, the amount of inflammation discovered is out of all proportion to the phenomena

* 'Arch. für Klin. Chir.,' 1876.

which preceded death. In one case there may be merely some injection of the peritoneum with loss of its polished surface, and in its place a general stickiness and a few frail and insignificant adhesions. In another, there may be an ounce or so of thin greenish pus around the cæcum, an exudation looking ill-conditioned enough to the surgical eye, but still a mere scanty mixture of pus and turbid fluid, and not the kind of formidable effusion which would be expected in a case of death from inflammation.

As a matter of fact, the contrast between the phenomena before death and the degree of inflammation found afterwards may be still more marked, as the following case will show:—

A woman of 62 came into the London Hospital with a femoral hernia which had been strangulated four days. Herniotomy was at once performed; some omentum was removed, and the purple coloured gut was reduced. For the rest of the day and during the day after the patient vomited with little cessation, her abdomen became swollen and painful, her pulse failed, and her strength declined. She passed into the condition already described, and on the morning of the third day she died. Throughout the temperature had never risen as high as 99°. The autopsy revealed an operation without a flaw, and an abdominal cavity showing no morbid change but a faint injection and a fainter dulling of the lower districts of the peritoneum.

Such a case may be rightly described, in accordance with ancient usage, as one of death from peritonitis, but it can hardly be spoken of as death from inflammation.

A further aspect of the case may be illustrated by sundry experiments upon animals.

If a certain dose of a particular septic matter be introduced into the peritoneal cavity of an animal, peritonitis follows; of which the animal dies in three or four days, and there is found at the autopsy the characteristic changes in the serous membrane. If a smaller dose of the same poison be used, symptoms of peritonitis follow, from which the animal may recover with or without the previous development of an encysted intra-abdominal abscess. If a larger dose be employed, the animal may die within 24 or 30 hours with symptoms which are at least suggestive of peritonitis, and yet exhibit after death a peritoneum either devoid of any evidences of inflammation, or displaying the most insignificant changes.

A similar order of circumstances would appear to hold good in the human subject. In some of the most rapid cases of death after such a lesion as is known to be capable of causing peritonitis, no

inflammatory changes are found within the abdomen. The patient is said to have died of shock, and the cause of that shock would appear in the majority of instances to be due to the profound nerve irritation caused by the sudden spreading of noxious micro-organisms or their products over a wide and sensitive surface. In the next series of cases the patient lives for three or four days; he exhibits the features of acute peritonitis, and after death the serous membrane is found to show but the early manifestations of inflammation. In other instances recovery follows after a more or less desperate illness, and this may be effected with or without the development of encysted suppuration.

In the human subject, as in the laboratory experiments, it must be remembered that where the question of sepsis is concerned, not only must the dose be considered, but also the power of resistance of the individual.

In further support of the statement that in the larger proportion of examples of fatal peritonitis the leading symptoms are those of poisoning and not of inflammation, and that death is due rather to toxæmia than to inflammation of the serous membrane, the following points may be adduced.

It is noteworthy that the cases in which suppuration is the most pronounced are among the most favourable examples of peritonitis, and that on the other hand the most acute and unfavourable cases are found with those which show the least inflammatory changes.

I shall have to refer later on to a collection of 100 cases of peritonitis obtained from the records of the London Hospital. Out of this number 70 died. If there be excluded from these fatal cases 13 in which the cause of the peritonitis was either never discovered or was due to cancer or tuberculosis, there remain 57 examples of death. In only 15 of these was the exudation found to be purulent; in 11 it was described as sero-purulent; in the remaining 31 examples there was no suggestion of pus. This is hardly what would be expected in a disease the leading phenomena of which are inflammatory.

In not a few instances of puerperal peritonitis the cases, if regarded pathologically, are merely examples of septicæmia in the most ordinary sense. In addition to the usual constitutional signs of that condition, there are certain local symptoms which indicate a disturbance within the peritoneum.

For example, a woman, aged 31, developed some three weeks after her confinement the signs of peritonitis. She died in four days. During that time she continued to vomit, although not severely, and in those four days she had three well-marked rigors, and her temperature ranged from 100° to 105°. So apparent was it that there was some peritoneal effusion, that an exploratory puncture of the abdomen was made on the day before death, but without result. The autopsy revealed some localised non-suppurative peritonitis around the uterus, which was fixed. The general peritoneum was quite sound. There was commencing pleurisy of the left side.

Then, again, the surgical treatment of acute diffused peritonitis as a purely inflammatory affection has not been very successful, and has indeed been comparatively unsuccessful.

This treatment consists of incision and the evacuation of the effusion. It answers admirably in suppurative inflammation of the pleura, and in cases of localised purulent peritonitis, as met with in the pelvis and about the cæcum, and in the tuberculous variety, but in the form of peritonitis now under consideration it is comparatively useless.

It may be also incidentally mentioned that the mortality attending the operation for strangulated hernia does not appear—except in connection with umbilical hernia—to have been greatly improved since the introduction of aseptic measures in surgery. These measures, if complete, are assumed to reduce the risks of inflammation in an operation like herniotomy to a minimum.

But even in cases in which neither gangrene nor perforation of the gut occurs, it is evident that there is something besides mere inflammation which is leading to death.

It must not be assumed in a contrary direction that inflammatory phenomena are wholly subordinate in peritonitis.

In many instances, such as those consequent upon troubles in the pelvis or in the vermiform appendix, the signs of inflammation are paramount. There may be an initial rigor, the fever is high, the pain and tenderness are intense, and the production of aggressive pus is often early and vigorous. Moreover, in tuberculous peritonitis the leading symptoms more usually belong to the category of chronic inflammation, aad the patient not infrequently dies of suppuration and its consequences. One cannot avoid repeating that these cases represent the more favourable aspects of peritonitis, and that they respond well to those general operative measures which are applicable to inflammation.

In concluding this part of the subject, it is only fair to say that

other views of the mode of death in peritonitis are held by many competent authorities, and in illustration of this I cannot do better than refer to the very thoughtful and original monograph on this subject by Dr. John Malcolm,* who contends that to nervous disturbances must be referred many of the conditions which have just been discussed.

The Peculiarities of the Peritoneum.—It is obvious that there are phenomena attending a lesion of the peritoneum which a reference to like disturbances in other serous membranes cannot explain.

Both pleuræ may be violently inflamed, and that inflammation may run on to suppuration, and yet the condition has not the gravity of a case of peritonitis in which the evidences of inflammation may be slight, and in which the exudation, if collected, may only amount to a few ounces of sero-purulent fluid. Even when the necessary allowance is made for the greatly different extent of surface in the two cavities, an explanation of the differences in the relative prospects of death is not forthcoming. It will be said that the gravity of the two cases depends not upon a damage to the serous membranes, but upon a resulting disturbance of function in the viscera they cover. From this point of view peritonitis may be considered to be more aptly compared with inflammation of the meninges of the brain. But even this comparison is not entirely satisfactory. That death must follow a gross interference with the functions of the brain is obvious, but it is not so evident that those who die of peritonitis die because the functions of the abdominal viscera are gravely disturbed. We do not encounter in peritonitis such fatal functional disturbances as suppression of bile or suppression of urine. In a case of acute peritonitis ending in death in four days we have for that time the following evidences of abdominal disorder. There is constant pain, and frequent vomiting, and absolute constipation, and the ingestion of no food. But a patient may be in pain for four days, and may be starved for four days, and may vomit for four days, and have no action of the bowels for four days, and yet live. So far as functional disturbance of the viscera within the belly is concerned, it is safe to say that in many cases of severe lead poisoning which end in recovery the visceral disorders are more considerable than they

* 'Medical Society's Transactions,' 1893, vol. xvi, p. 188.

are in some examples of peritonitis which end fatally in a few days.

Then, again, septic matter often finds its way into the pleural cavity. It is true that serious symptoms may follow, but they are by no means of necessity fatal, and are certainly not to be compared in gravity and deadliness with the results of introducing a part of the same septic matter into the peritoneal cavity.

The following points may be noted with regard to the peritoneum :—

(1.) Its surface is very considerable, and is probably, as Wegner* states, as great as that represented by the whole integument of the body.

(2.) The membrane possesses remarkable powers of absorption, as shown by the manner in which milk, blood, peptones, &c., are taken up. It is said to be capable of absorbing an amount equal to from 3 to 8 per cent. of the body weight. It is noticed that septic intoxication occurs quicker in peritoneal infection than in any other. Dirt, pus, fæcal matter are more dangerous to life when introduced into the peritoneal sac than when brought into contact with any other like cavity.

(3.) The peritoneum offers a limited resistance to septic organisms and their products. Experiments upon animals and clinical experience in man show that it can safely dispose of a certain quantity of septic germs. The precise process by which this is effected is a matter of some doubt. There is evidence to show that the resistance of the peritoneum varies within wide limits, and is affected by age, and by such enfeebling disorders as chronic liver or kidney disease. The peritoneum of the rabbit appears to be remarkably sensitive to sepsis, whereas that of the dog has comparatively high powers of resistance.

The intestinal mucous membrane affords an infinitely less sensitive medium for septic infection than does the serous covering of the bowel.

(4.) No tissue in the body provides more favourable conditions for healing than does the peritoneum.

(5.) The peritoneum does not show the same degree of vulnerability in all parts, nor are all portions of it alike in the manner in which certain lesions are responded to.

The part which is apparently most sensitive to infection, and

* 'Verhand. d. Deutsch. Gesell. für Chirurgie,' Berlin, 1877.

which is most prone to rapidly spreading and diffuse inflammation, is that which covers the small intestine.

The parietal peritoneum has certainly not so high a degree of susceptibility, and is not so apt to assume the diffuse and low form of inflammation.

The morbid changes in peritonitis are more marked and more advanced on the visceral layers and omentum than upon the parietal part of the membrane, and this circumstance is not always to be accounted for by the point of origin of the trouble.

Terillon* showed that the effect of irritation of the peritoneum is comparatively feeble over the parietal layer or over the liver, while it is violent and intense when the membrane covering the intestines is involved.

Localised forms of peritonitis and encysted exudations are comparatively uncommon in the large area occupied by the small intestine.

Localised peritonitis is met with in those regions which are more or less unoccupied by the coils of the lesser bowel, viz., in the subphrenic district between the dome of the diaphragm above and the transverse colon below, in the region of the cæcum, and especially in the outer side of that region, and lastly in the pelvis. If a list be drawn up of cases of peritonitis which have either been recovered from spontaneously or have been relieved by operation, the great majority will be in one or other of these three districts. It is certain that localised purulent collections are uncommon except in these situations. It is remarkable, moreover, what extensive progress peritoneal inflammation may make in the region of the liver or within the pelvis without inducing very alarming symptoms, and it is interesting also to note how wholesome is the type of the inflammation in many cases, and how substantial are the adhesions produced. Of the localised troubles in the cæcal region, the same can only be said in a modified degree.

The fatality of injuries of the intestine is well known, and the attendant peritonitis spreads like a fire. Lesions of the liver and of the bile passages are, on the other hand, often followed by a peritonitis which is slow and moderate, and which may end in recovery.

In making these comparisons it must not be forgotten that in the bowel lesion there will be greater opportunities for septic in-

* 'Progrès Médical,' 1883, p. 645.

fection than in the case of a limited injury to the biliary passages, although in many instances of death from wound of the gut there has been no appreciable extravasation of its contents.

Mickulicz* speaks of the transverse colon as if it were a barrier to prevent the spread of peritonitis downwards, and suggests that the comparatively simple character of pelvic peritonitis may be due to the dependent position of the pelvic basin.

(6.) The peritoneum appears to be possessed of great sensitiveness—a matter of moment in the production of shock. This sensibility is evidently peculiar, and is not quite comparable to that possessed by the skin. Certainly the peritoneum does not feel pain as does the skin.

The twisting of a hernial sac and the securing of it with a tight ligature is seldom followed by much distress, and yet the same process carried out on integument of equal extent would assuredly be attended by considerable nerve disturbance.

The pain which may accompany the injecting of a large hydrocele with iodine is noteworthy.

The handling of perfectly normal peritoneum is attended with more or less distress in conscious patients. This is illustrated in iliac colotomy performed without anæsthesia, in the reduction of prolapsed coils of intestine covered with unaltered peritoneum, and especially in the removal of gauze tampons.

I have several times had occasion—especially in operations upon the liver—to place a tampon of iodoform gauze upon normal peritoneum, and the removal of this within 24 hours is intensely painful. On one occasion a portion of unaltered omentum escaped with the plug, and the replacement of that tissue caused great distress.

When the surface of the serous membrane has become inflamed and covered with lymph, the ordinary sensibility appears to be dulled or lost. This is noticed in the decrease of pain and tenderness which is not uncommon as a plastic peritonitis advances, and also by the fact that in iliac colotomy or gastrostomy carried out in two stages, the cutting of the gut or of the stomach when once it has become covered with lymph, is more or less entirely painless.

The irritant which of all others appears to affect the peritoneum

* ' Deutsche Gesellschaft für Chirurgie,' 1889, p. 303.

the most acutely, is that represented by the invasion of the surface by certain bacteria or by their products.

The disproportion between the intensity of the pain and the comparatively small area of infection, is often to be well seen in cases of disease of the vermiform appendix.

(7.) One matter of great interest, although of some obscurity, concerns the condition of pressure within the abdominal area, and the effects which follow upon the disturbance of it.

It has been many times pointed out that there is no cavity of the abdomen, and that the term, the sac of the peritoneum, is a misnomer. "Every practical anatomist," wrote Benjamin Travers nearly a century ago, "has a familiar illustration of the non-existence of an abdominal cavity in the operation of laying open the abdomen."*

In performing laparotomy, the surgeon is constantly reminded that he is cutting into a vacuum, and is exposing what is merely a potential cavity. This appears to be more noticeable when the operation is quickly done. I have the impression that when the serous membrane is fully exposed and yet undivided, air may pass through it into the potential space. Some invisible damage may have been wrought by the forceps in some of the more striking instances. Sometimes, especially in a child, a loop of gut may be seen through the peritoneum to be lying in the very closest contact with it. A minute prick is made, and the gut seems to fall away from the membrane, and a cavity is revealed.

One would imagine that the disturbance of pressure relations of this kind, could not be without effect upon the sensitive tissues and thin-walled blood-vessels within the abdominal parietes. The effect of a mere incision into the abdomen is often entirely remarkable. In not a few cases of tuberculous peritonitis a simple laparotomy has been performed, the fluid within the abdomen has been allowed to escape, and the wound has been hastily closed. Yet to the surprise of the operator this elementary proceeding has been followed by complete cure.† Aldibert‡ reports the case of a child in whom a simple laparotomy was followed by the disap-

* "An Inquiry into the Repairing of Injuries of the Intestines," London, 1812, p. 8.

† Spencer Wells, "Diseases of the Ovaries," 1865, p. 331.

‡ "De la Laparot. dans la Periton. Tub.," Paris, 1892.

pearance of numerous tuberculous mesenteric glands discovered at the operation. What explanatian is there to give ?

The examples in which complete and quite unexpected relief of abdominal troubles has followed the mere opening of the peritoneal space are numerous. Many remarkable instances have been collected by Professor William White, of Philadelphia, in an interesting paper on the curative effect of operations *per se*.* If all those cases of cure by simple incision be excluded in which a neurosis may have been the foundation of the trouble, there still remain many instances in which the assumption is very strong, that considerable physical changes within the abdomen must attend the mere opening of the cavity. Two such instances are afforded by the following cases :—

A middle-aged man had all the symptoms of stricture of the pylorus, and was suffering considerable distress. There was some doubt as to the cause of the stenosis. I opened the abdomen, discovered a malignant growth of the stomach, and closed the wound immediately. The parts were in no way disturbed. The patient at once improved, the vomiting ceased, and the dilatation of the stomach diminished. The improvement was maintained for no less a period than six weeks, and before the completion of that time the patient had returned to his easy duties as a gate porter. In due course all the symptoms reappeared, and the case followed the ordinary course of cancer of the pylorus.

The second case was one of suppurative pylephlebitis, and represents—so far as I can ascertain—the only instance in which this grave condition has been treated by operation. The case was under the care of Dr. Frederick Parsons, of Wimbledon, to whom I am indebted for permission to publish this brief preliminary account. The patient was a young lady of 15, who was attacked on September 17, 1892, with typhlitis. There was a previous history of constipation and of indiscretions in diet. The symptoms were severe and, in spite of prompt treatment by rest, opium, hot fomentations, and enemata, continued to pursue an acute course. On September 24 the patient had a severe rigor. From this date until October 17 she went from bad to worse. Her temperature ranged from 97·6 to 105. She had a very severe rigor almost every day, but not with any definite regularity. The abdomen remained painful, tender, and distended, the vomiting was distressing, the wasting was rapid, and delirium supervened. On September 29 pain was first experienced in the back on the right side and just below the last rib. Later on tenderness was noticed over the liver, and that organ became considerably enlarged. There was at no time jaundice or ascites.

The case had certain points of resemblance to malarial fever, and the account of suppurative pylephlebitis given with much detail in Pepper's 'System of Practical Medicine' may have been founded upon this individual case.† The patient was seen by Sir William Broadbent, and it was

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* 'Annals of Surgery,' August and September, 1891.

† Vol. ii, p. 1097, London, 1885. See also accounts by Dr. Bradbury,

advised that an exploratory incision should be made over the liver. This I carried out on October 17.

The following conditions were revealed. There was no peritonitis; there were a few adhesions about the cæcum; the appendix was normal. The gall bladder contained about half an ounce of bile. The liver was greatly and evenly enlarged, and was as soft as a lung. It was dotted all over—so far as its surface could be exposed—with minute yellow specks which were of the size of a hole made with an ordinary pin. These specks could be seen but not felt. On actual measurement three were counted in one square inch. After having made the inspection I closed the abdomen. From this day forth the child made an uninterrupted recovery, the rigors were never repeated, the vomiting ceased, and the temperature gradually sank to normal. She is now in perfect health. The case shows that typhlitis does not always depend upon mischief in the appendix, but that it may be due, as was apparently the cause in this instance, to a stercoral ulcer in the cæcum. Dr. Bartholow, the writer in Pepper's 'System of Medicine,' states that "the most frequently occurring cause of pylephlebitis is ulceration and suppuration of some part of the intestinal tube, and hence the most common result is multiple abscess of the liver." Another sentence from the same monograph may be added, "the termination is death, doubtless invariably."

I cannot help thinking that an explanation of this different result will be forthcoming when something more is known of the pressure conditions within the abdomen.

There are certain other points in connection with intra-peritoneal pressure which remain to be mentioned. In the first place, gravity does not appear to follow the usual lines within the abdomen. One would expect that any effusion which is free within the cavity of the belly would find its way into the pelvis as the most dependent part, and that this would take place even in patients who are lying in bed. It is quite obvious that adhesions must much influence this matter. At the same time, the great frequency with which this action of gravity appears to be inoperative, or at least imperfect, is so marked as to call for some explanation. In the second place, the frequency with which escape of fæces fails to take place in spontaneous perforation of the intestine and in punctured wounds of that viscus is somewhat remarkable. Travers* lays especial stress upon this, and gives several illustrative cases. He is of opinion that the explanation is to be found in the state of pressure within the abdomen.

Zeigler† states that in 15 cases of laparotomy for wound of the

'Medical Times and Gazette,' September 27, 1884; Dr. Bristowe, 'Transactions of Pathological Society of London,' vol. ix, p. 278; and M. Chauffard, 'Traité de Médecine,' by Charcot, Bouchard, and Brissaud, t. iii, Paris, 1892.

* *Loc. cit.*, pp. 16—18, *et seq.*

† "Über die intestinale Form der Peritonitis," Munich, 1893.

intestine, fæcal extravasation was found to have taken place in six instances only. He also considers that this is to be accounted for by pressure, and alludes to the observation of Klemm,* who asserts that the idea that the wound in the bowel is blocked up by prolapsed mucous membrane is fallacious.

(8.) The last point concerns the possibility of the peritoneum acquiring some degree of immunity from septic infection.

It has been shown by Reichel† and others that in dogs an immunity from peritoneal infection from pyogenic cocci can be produced artificially. A small dose of septic material is introduced into the abdominal cavity, and after the animal has recovered from the disturbance produced a large dose is injected. This process is repeated at intervals with increasing amounts of the poison until at last no symptoms are induced by an amount which in a control experiment would cause death within 24 to 36 hours.

A not unlike invulnerability appears to be possible in the human subject. Other things being equal, an operation carried out within the abdomen of a person who has had chronic peritonitis, or who has exhibited repeated subacute attacks, and whose peritoneum presents substantial adhesions, is likely to be attended with better results than when the peritoneum is found to be wholly undisturbed. In the operation for removal of the vermiform appendix in cases of relapsing typhlitis, the little disturbance which follows extensive procedures occupying as long as one and a half hours can, I think, only be explained by an immunity acquired by the peritoneum after repeated attacks of inflammation. Moreover, in advanced cases the disproportion which is often noted between the constitutional disturbance and the local condition discovered at the operation appears to be capable only of the same explanation.

I have reported‡ the case of a woman with a fæcal fistula, due to the destructive suppuration of a dermoid cyst of the ovary. I opened the abdomen for the purpose of closing the fistula. The tract led down to a hole in the sigmoid flexure, which was firmly fixed in the left iliac fossa. As the bowel could not be brought to the surface, and as the opening could not be sutured *in situ*, there

* 'Deutsche Zeit. für Chir.,' 1892.

† 'Deutsche Zeit. für Chir.,' Bd. xxx, p. 1.

‡ 'Lancet,' June 10, 1893, p. 1376.

was nothing to be done but to leave it and to pack the area between the hole in the bowel and the parietal wound with iodoform gauze. Very extensive adhesions existed, and for some 12 months previously there had been a smouldering peritonitis. The patient did well, and the good result was probably to no small extent due to the immunity the peritoneum had acquired during the 12 months of inflammatory turmoil.

In looking over the records of laparotomy performed for perforations in the stomach or bowel, it is impossible not to be struck with the fact that in many of the successful cases there had been long antecedent visceral or peritoneal trouble.*

LECTURE II.

The Causes of Peritonitis.

Of the many classifications of peritonitis which have been attempted, those are the most satisfactory in which the etiology has been taken as a basis. Even when this method of division has been regarded, there is no disease which has been broken up into more varieties or burdened with more differentiation than has the affection under consideration.

In the very elaborate monograph on peritonitis by Spillmann and Ganzinotty,† no less than 26 different forms of the disease are described, and even these are subjected to many and complex subdivisions.

Every addition to our knowledge of inflammation of the great serous membrane tends to make the classification of its various forms more and more simple.

It has now become evident that peritonitis depends almost entirely, if not entirely, upon infective processes, and that these agencies are concerned, directly or indirectly, in every form of the disease.

There are those who maintain that there is no form of peritonitis which is not due to infection, and although the data upon which such an assertion is based are not entirely perfect, there is yet much presumptive evidence in favour of its accuracy. Indeed, the

* Note Cases by Kriege, 'Berlin. klin. Wochen.,' 1892.

† "Dict. Encyclo. des Sc. Méd.," Paris, 1887.

domain of non-infective peritonitis is becoming rapidly more and more dubious.

In dealing with any classification in which an infective process is the main element there are many general considerations to be borne in mind. On the one hand there is the dose of the poison, and on the other hand there is the soil into which it is introduced. The dose must obviously be liable to considerable variations, not only in amount but also in virulence, while the conditions offered for growth by the inoculated body must differ to even a wider and more complex extent.

The resistance of the individual to the growth of septic organisms is influenced by a multitude of circumstances, the value of which is scarcely susceptible of being formulated. There are questions of age and of health, and of such unfavourable affections as Bright's disease, diabetes, and alcoholism. There are local conditions which lend themselves to the more ready cultivation of germs, such as extensive damage to the peritoneum, and extensive interference with its functions of absorption—or, at least, with that ill-understood power it possesses of dealing with noxious micro-organisms. There are the presence of ascites, and the coexistence of extravasations of blood, bile, or intestinal matter in the peritoneal cavity. There is, finally, the entirely undefined peculiarity of the individual which appears to alone render one man susceptible and another almost exempt.

In the great majority of instances, peritonitis depends upon what Tavel and Lanz* call "continuity infection." By this is understood the direct spreading of the infection to the peritoneum from a neighbouring tissue other than the serous membrane. Under such heading would be included peritonitis following hernia or any visceral lesion or disease capable of producing the trouble, puerperal peritonitis, most forms of pelvic peritonitis, and certain varieties of tuberculous peritonitis. It would exclude the larger number of the cases of inflammation of the serous membrane which follow accidental or operation wounds.

With peritonitis due to infection by continuity must be included what is conveniently termed by the authors just named "chemical peritonitis." Here the peritoneum is invaded not so much by the micro-organisms themselves as by their chemical products. The serous membrane may absorb these products from adjacent tissues,

* "Über die Ætiologie der Peritonitis," Basel, 1893.

for in a few examples of peritonitis no micro-organisms have been discovered in the exudation after careful examination by competent observers.

The following classification of peritonitis according to its cause appears to be justified by our present knowledge of the subject.

(1.) *Peritonitis due to Infection from the Intestine.*—Under this heading are included most cases of peritonitis associated with hernia, with intestinal obstruction, and with perforation; peritonitis due to any form of ulceration of the bowel; to enteritis; to cancerous growths of the gut, and to troubles in the appendix. There will also be included peritonitis due to inflammatory changes in the biliary canals, and some forms of peritonitis following upon operation.

The micro-organism which is usually found associated with these different forms of peritonitis is the bacterium coli commune.

(2.) *Peritonitis due to Infection from Without.*—This division will include puerperal peritonitis, peritonitis consequent upon inflammatory troubles in the genital organs or in the parietes of the abdomen, and some forms of peritonitis following upon operation.

The micro-organisms usually associated with the varieties considered under this heading are pyogenic cocci, and notably the streptococcus pyogenes.

(3.) *Peritonitis due to the Pneumococcus.*

(4.) *Tuberculous Peritonitis.*

(5.) *Peritonitis of a Doubtful Nature.*—Under this purposely indefinite heading it will be convenient to discuss—(*a*) Peritonitis due to irritants; (*b*) forms of the trouble reputed to depend upon rheumatism, gonorrhœa, syphilis, Bright's disease, and alcoholism; and (*c*) peritonitis met with in the newly born.

In order to form an approximate idea of the relative frequency of different forms of peritonitis, two tables are appended. The first is an analysis of 100 cases of peritonitis taken from the records of the London Hospital. The only test applied in the selection of these cases was evidence that the clinical details and the accounts of the autopsy (in the fatal examples) were as complete as possible. The latter accounts are from the 'Pathologists' Reports.' The clinical details in the 100 cases are practically complete as regards temperature, account of vomiting, state of the bowels, pulse, respirations, &c., and in the majority of instances a

TABLE I.

Peritonitis.	Number of cases.	Sex.		Average age.	Result.		Time of death.					Exudation in fatal cases.					Vomiting absent or very slight.	Bowels loose.
		Males.	Females.		Deaths.	Recoveries.	In 36 hours.	In 48 hours.	3rd to 4th day.	5th to 7th day.	After 7th day.	Commencing.	Plastic.	Serous.	Sero-purulent.	Purulent.		
With hernia	10	3	7	52	10	0	0	0	6	2	2	3	3	0	3	1	2	2
With perforation of bowel	9	4	5	40	9	0	4	2	0	2	1	2	3	1	1	2	2	3
With gross disease of bowel	6	4	2	40	6	0	3	0	0	2	1	1	2	1	2	0	2	3
With disease of appendix	22	19	3	22	6	16	0	0	0	5	1	0	1	1	1	3	4	4
Starting from lesions about the pelvis	18	5	13	36	11	7	3	1	1	6	0	3	1	0	2	5	2	6
Following abdominal wounds	14	2	12	36	14	0	0	1	5	5	3	2	6	1	2	3	5	4
By extension from the pleura	1	0	1	32	1	0	0	0	1	0	0	0	0	0	0	1	0	0
Tuberculous	8	2	6	20	5	3	0	0	0	1	4	0	2	3	1	0	3	4
Diffuse cancer of peritoneum	2	2	0	42	2	0	0	0	0	0	2	0	0	2	0	0	1	0
Causes of peritonitis unknown	10	2	8	29	6	4	0	0	1	0	5	0	3	3	0	0	2	2
—	100	43	57	—	70	30	10	4	14	23	19	11	21	12	12	15	23	28

daily statement of the patient's symptoms is given. For the making of this laborious collection of cases I am indebted to Mr. A. Hallidie, F.R.C.S.

The second table is from the monographs by Fränkel ('Wien. klin. Wochen.,' Nos. 13–15, 1891), and Tavel and Lanz (*loc. cit.*).

TABLE II.

Cases of Peritonitis in Man in which Micro-organisms were found in the Exudation.

	Fränkel. Found alone.	Tavel and Lanz.	
		Found alone.	In association.
Bacterium coli commune	11	15	16
Streptococcus	7	3	15
Staphylococcus	1	2	6
Pneumococcus	1	0	2
—	20	20	39

(1.) *Peritonitis due to Infection from the Intestine.*—As already stated, the micro-organism which appears to be usually answerable for the numerous forms of peritonitis met with under this heading is the bacterium coli commune. This most remarkable and common bacillus was first described by Escherich* in 1885. Its definite pathogenic properties remained imperfectly recognised until 1889, when they were expounded by Laruelle,† by Roux and Rodet,‡ and many others.

Within the last few years the literature appropriated to this little organism has become so extensive as to be almost overwhelming.§

The morphology of the bacillus—with which we have no con-

* 'Fortschritte d. Med.,' 1885.

† "Etude bactér. sur les Periton. par perforation," 'La Cellule,' 1889, vol. 5.

‡ 'Lyon Médical,' 1889.

§ One of the most valuable monographs is "Le Bact. Coli Commune, son Rôle dans la Pathologie," by Dr. Macaigne. Paris, 1892. Another good general account is by Malvoz ('Arch. de Med. Exper.,' 1891, p. 593), and another by Welch ('Trans. Congress of American Phys. and Surg.,' vol. 2).

cern in this place—has been elaborately dealt with by Wurtz,* Macaigne, and other writers.

It has been shown to be identical with the bacillus pyogenes fœtidus, obtained by Passet in 1885, from the stinking pus of a peri-rectal abscess.

It has been proved to be the same micro-organism as the bacillus lactis ærogenes, and the pyogenic urinary bacterium, described by Clado and Albarran in 1891.†

In many particulars it closely resembles the bacillus of typhoid, but the distinguishing features of the two micro-organisms have been fully pointed out by Trambusti,‡ Péré,§ and Wurtz.‖

The bacterium coli commune exists normally in the human body, and is found in individuals in a state of perfect health. It has been demonstrated to be present along the whole length of the alimentary canal from the mouth to the anus.¶ Its natural habitat is the bowel. It is said to be especially numerous in the duodenum** and in the colon, and has been found in the bile passages.

It is certainly the most abundant and the most constant of the bacteria found normally in the human body, and has been estimated to form 95 per cent. of the micro-organisms met with in the bowel of man. Sternberg†† gives a list of 48 micro-organisms which have been isolated from human fæces or the contents of the intestine. Of this number 25 are non-pathogenic, and of the pathogenic forms not a few represent the same bacillus under different names. There is no doubt that special names have been given to micro-organisms which are mere variations of one common form.

This matter is well dwelt with in the excellent monograph by Tavel and Lanz,‡‡ a work which forms by far the most important

* 'Archiv. de Méd. Exper. et d'Anatom. Pathol.,' January 1, 1893.

† 'Compt. rend. Soc. de Biol.,' 1891, p. 830.

‡ 'Centralb. f. Allgem. Path.,' May 1, 1892.

§ 'Annales de l'Institut Pasteur,' July 25, 1892.

‖ 'Archiv. de Méd. Exper. et d'Anat. Path.,' January 1, 1893.

¶ Vignal. 'Arch. de Phys. Norm. et Path.,' 1886-87.

** See, however, on this point Gessner. "Über die Bakt. im Duod.," 'Arch. für Hygiene,' bd. ix, p. 128.

†† 'Manual of Bacteriology,' New York, 1892. Booker isolated twenty-one different kinds of bacteria from the contents of the small bowel in cases of diarrhœa.

‡‡ "Über die Ætiologie der Peritonitis," Basel, 1893.

recent contribution to the subject of the etiology of peritonitis. Tavel and Lanz regard the term bacterium coli commune as a generic term applicable to an extraordinarily numerous family of bacteria. They themselves indicate some 20 varieties in this great family. These authors also have pointed out that the colon bacillus is sometimes mobile and possessed of cilia, and sometimes immobile. They do not, however, associate any pathogenic differences with these two forms, which they have admirably figured.

The bacterium coli commune has a striking feature in that it appears to vary in virulence.

So far as experiments upon animals are of value, it would seem to be quite harmless when taken from the normal intestine. A culture of the bacillus so obtained has no effect when injected into the peritoneum of animals.*

If, however, the bowel become the seat of certain diseased conditions (or it may almost be said of *any* diseased condition), then the bacillus becomes at once virulent.

Virulence has been found to be developed in cases in which the bowel was obstructed, strangulated or inflamed, in venous congestion of the gut, in œdema of the bowel wall, in diarrhœa, in typhoid fever, and in cholera.

In a case of diarrhœa produced by tartar emetic, this colon bacillus was found to have become virulent.†

It also appears to develop qualities for evil in instances of advanced constipation.

In any case experiments show that the virulence when once developed may vary considerably in degree.

Tavel and Lanz describe an interesting case of localised abscess due to mischief in the vermiform appendix. The pus was swarming with the colon bacillus. Quantities of the same bacillus were found in the peritoneum, but there was no peritonitis. Much gas was discovered in the peritoneal cavity.

When the intestine is healthy, the bacterium coli commune has little disposition to escape through the gut wall or to invade the tissues of the body after death. If, however, the intestine be damaged or diseased, then the bacterium shows an active inclination to penetrate through the bowel wall, and is usually found to

* Le Sage and Macaigne, 'Archiv. de Méd. Exper.,' 1892, vol. iv, p. 350.

† Fränkel, *loc. cit.*; Macaigne, *loc. cit.*

have extensively invaded the tissues after death.* The disposition of the bacillus to pass through the intestinal wall under the circumstances just stated, is well illustrated in examples of slight degrees of strangulation of the bowel produced by experiment in animals.†

The effect of injecting a culture of the virulent colon bacillus into the peritoneum of animals varies—other things being equal—according to the dose. In the slightest cases the animal, after an illness in which diarrhœa is a symptom, recovers. In another grade a localised purulent peritonitis is produced which follows a chronic course. In the third degree death is rapidly brought about by a diffuse fibro-purulent peritonitis. In instances in which a large dose is employed, the animal dies of acute sepsis before any phenomena of peritonitis are produced.

It may here be noted that when peritonitis *is* produced it is usually purulent.

The presence of fluid in the peritoneum and especially of blood, greatly aids the development of peritonitis in these experiments.‡ The activity also of the bacillus is much increased, if it be injected with sterilised fluid from the intestine as a medium. If a sterile saline solution be used the effect is diminished.§

It may be mentioned that the endothelial cells of the peritoneum do not appear to act as phagocytes, for in various experiments in which the colon bacillus was injected into the peritoneal cavity, it was never once found by Ziegler within these cells.

It has been clearly demonstrated that the bacterium coli commune can produce pus after inoculation. It has been found in man in a state of almost pure culture in the pus from an ischio-rectal abscess.

So far as the human subject is concerned, it has been shown that these various forms of peritonitis which are assumed to be of intestinal origin, depend mainly and in many instances solely upon the bacterium coli commune.

In peritonitis associated with hernia, the colon bacillus is the micro-organism most commonly found in the sac. This is the case in all stages of strangulation, and is independent of the

* Paul Ziegler. "Über die intest. Form der Peritonitis," Munich, 1893.

† Arndt, 'Centralb. f. Bakt.,' 1893, xiii, p. 173.

‡ Ziegler, *loc. cit.*

§ Laruelle, "La Cellule," 1889, vol. 5.

character of the fluid, the bacilli being obtained in cases in which the fluid in the sac is copious and opaque, as well as in those in which it is clear and scanty.

In fifteen examples of hernia Bönnecken* found the bacterium coli in the sac in thirteen instances.

The bacillus sc commonly found in the hernial sac by Clado† in 1889, is now known to have been the colon bacillus.

Tavel and Lanz examined bacteriologically the exudation in the sac, or in the adjacent peritoneum in 21 cases of strangulated hernia, in two cases of "hernial hydrocele," and in one case of suppuration of the sac. In 18 instances they discovered no micro-organisms of any kind. In five examples—including three in which the gut was apparently not involved in the rupture—bacteria were found, the most common being the bacterium coli commune. The authors consider the cases unassociated with micro-organisms to be examples of "chemical peritonitis," and to be due to the products of bacteria rather than to the germs themselves; they do not, however, commit themselves to the opinion that the bacillus chiefly concerned is that now under consideration.

Laruelle‡ has demonstrated the bacterium coli commune in gangrenous hernia, and in gangrene of the gut produced artificially in animals.

Arndt§ has shown by a series of most carefully conducted experiments that micro-organisms can pass through the gut wall into the peritoneal cavity, when the strangulation is of quite a slight grade, and is very far short of producing even a limited gangrene.

Bönnecken's|| investigations give practically the same result.

Cornil¶ found bacteria actually in the substance of the wall of a partly necrosed intestine.

Tavel and Lanz are of opinion that while micro-organisms cannot pass through the wall of healthy bowel, they are very ready to escape if the gut be the seat of even a slight lesion.

* 'Virch. Arch.,' vol. cxx, p. 7.
† 'Congrès de Chirurgie,' 1889.
‡ "La Cellule," 1889.
§ 'Centralb. für Bakt.,' 1893, xiii, p. 173.
|| *Loc. cit.*
¶ 'Archiv. de Méd. Exper.,' t. i, p. 353.

It is only fair to say that Orth's* experiments do not support these very widely held opinions.

Macaigne gives an account of 35 cases of peritonitis of intestinal origin, in which the colon bacillus was the only organism present, or at least the principal one.

These 35 cases are distributed as follows :—

With troubles in the appendix	10	cases
With typhoid fever	9	„
With ulcerative enteritis	6	„
With perforation	3	„
With cancer of colon	3	„
With hernia....	2	„
With thrombosis of mesenteric vessels	1	„
With ulceration of gall bladder	1	„
Total	35	„

The researches of Welch, Ziegler, Fränkel, and Malvoz all bear in the same direction.

The colon bacillus has been shown by Cornil, Babes, and others to be almost exclusively the bacterium concerned in perforative peritonitis.

Barbacci† states also that it is practically the only bacillus to be produced in cultures from the exudation in perforative peritonitis in man. The same applies to perforative peritonitis produced experimentally in dogs. In this form of peritoneal inflammation the other micro-organisms found in fæces develop in the serous cavity but only for a time. The bacterium coli commune alone survives. Barbacci points out that the liberal development of this bacillus is greatly favoured by the presence of such a medium as is provided by the fluid contents of the intestine, a material which readily damages the peritoneal endothelium. He considers that death is due to absorption partly of the bacterial products, and partly of the noxious chemical matters contained in the intestinal fluid which escapes into the belly cavity.

In the same way it has been demonstrated that this micro-organism is the active agent in the majority of cases of peritonitis starting from the appendix.

Adenot‡ gives four cases of so-called appendicitis attended

* ' Central. für Chirurg.,' 1889, p. 849.

† ' Central. f. Path. ù Path. Anat.,' October 12, 1893.

‡ ' Compt. Rend. de la Soc. de Biologie,' 1891, vol. iii, p. 740. See also cases of Roswell Park, " Annals of Surgery," September, 1893, p. 310.

with suppuration, in the pus of which the colon bacillus was found in a pure culture. In another instance in the exudation upon the surface of a non-perforated appendix containing a concretion, this bacillus was the only micro-organism found.

Tavel and Lanz in the valuable work already quoted deal with 23 cases of trouble in the appendix. An examination was made either of the pus within or without the appendix, or of the exudation into the peritoneal cavity immediately around the diseased process. The material for this bacteriological examination was obtained during the patient's life. In three instances no micro-organism was found. In 19 examples the colon bacillus was found either alone or in association with other pathogenic germs. The streptococcus was found in several cases; the pneumococcus was met with in two examples, but not in pure culture. The staphylococcus pyogenes citreus was in one instance the only micro-organism discovered.

Tavel and Lanz give five cases of internal strangulation of the bowel, and one case of resection of the gut. In three of these the colon bacillus was found in the exudation of the peritonitis which resulted.

One of the five cases affords a good example of "chemical peritonitis." The patient, aged 40, had symptoms of intestinal obstruction. Laparotomy was performed on the seventh day. Strangulation by an omentum band was discovered. There was general peritonitis. The abdomen was drained. The fluid escaping from the drainage-tube proved to be sterile on cultivation. The patient recovered.

Bignami,* Bastianelli,† Le Sage, and Macaigne‡ have shown that in suppurative or ulcerative troubles of the gall-bladder or biliary passages, the bacterium coli commune is often the only bacterium found. Roswell Park§ has also furnished a case illustrative of this association.

In three examples of peritonitis following suppurative inflammation of the gall-bladder, Tavel and Lanz found the bacterium coli commune in two instances, and pyogenic cocci in the third.

This bacillus has also been found in cases of peritonitis following

* 'Boll. della R. Acad. med. di Roma,' 1891, F. iv and v.

† *Ibid.*, F. vii.

‡ 'Arch. de Med. Exp.,' 1892, vol. iv, 350.

§ 'Annals of Surgery,' September, 1893, p. 311.

operation, and on this subject Dr. Welch writes as follows*:—"Its presence several times in pure culture, in laparotomy wounds treated aseptically, although apparently not a source of serious trouble, was not a matter of indifference. It was generally accompanied with moderate fever, and a thin, brownish, slightly purulent discharge, of somewhat offensive, but not putrefactive, odour. The smooth and rapid healing of the wound was interfered with. In some of the cases there was evidence of intestinal disorder."

In the cases of peritonitis after laparotomy in which the colon bacillus is found, it is probable that such an injury had been inflicted upon the intestinal peritoneum at the operation as to permit the bacterium to escape through the bowel wall. It has been shown that it requires but little damage to the bowel or to its serous covering to allow of such escape.

It is well known that pneumonia is not an uncommon sequel of peritonitis, and it is possible that in certain of these cases the colon bacillus is the active agent.

It has been found in the pleura when pleurisy was present (Laruelle), and has been obtained by puncture from the hepatised lung some days before death from peritonitis (Macaigne). Fisher and Levy give two cases of strangulated hernia with pulmonary complications, and in both instances the colon bacillus was found in the affected parts of the lung.†

Finally, it has been assumed that some of the constitutional symptoms attending severe constipation may be due to the absorption of the products of this widely diffused bacillus.

The exudation associated with the bacterium coli commune when it attacks the peritoneum is often characteristic. It is well seen in cases of inflammation about the appendix. The fluid is at first clear and greenish-looking. It then becomes greenish-yellow, thin, semi-opaque, and foul smelling. If it pass on to suppuration, the pus has no especial characters except that it is frequently offensive. In chronic cases there is sometimes produced a white, soft, custard-like material, which is often met with in operations upon the appendix during a quiescent period, and which I do not think is changed pus, nor a residuum left by pus.

* 'Trans. Congress of American Physicians and Surgeons,' vol. ii.

† 'Deutsch. Zeit. f. Chir.,' 1891.

In some long-standing cases I have scraped away a full teaspoonful of this matter from about the cæcum.

In concluding the account of this variety of peritonitis, it may be pointed out that the irritant which induces the peritonitis and which reaches it from the intestine may follow more than one path. (*a*) Bacteria may escape through a perforation in the bowel; (*b*) they may pass through the wall of a segment of intestine which has been in some degree damaged, but not perforated; and (*c*) chemical products of bacteria may reach the peritoneum by either one of these routes.

(2.) *Peritonitis due to Infection from Without.*—It has been already observed that this variety of peritonitis usually depends upon pyogenic cocci. Of these the streptococcus is the one most usually met with. It is often alone, or it may be found in association with other micro-organisms, among which, however, it is the chief.

That the streptococcus is the usual agent in puerperal peritonitis has been shown by Widal, Bumm, Fränkel, and Courtois-Suffit.* It has been met with in association with putrefactive bacteria in examples of perforative peritonitis by Predœhl and others.

The staphylococcus is very rarely met with alone in cases of peritonitis, and is usually associated with the more virulent form of coccus. (See Table II.)

So far as experiments go it has been shown that injections of pyogenic cocci into the peritoneum act more vigorously if mixed with a fluid difficult of absorption, or if introduced with a corrosive fluid capable of damaging the peritoneal endothelium.

In 20 instances reported by Pawlowsky,† in which the staphylococcus was introduced into the abdomen of animals, death followed in 18 cases from purulent or hæmorrhagic peritonitis. A drop, or even half a drop, of fluid from a case of puerperal peritonitis may kill an animal when injected into the abdomen, whereas in a control experiment a syringeful of the exudation from an example of peritonitis after operation may not lead to a fatal result.

The pyogenic cocci, and most usually the streptococci, have

* 'Gaz. des Hôpitaux,' November, 1890. 'Munchen. med. Wochen.,' 1889, No. 42.

† 'Central. f. klin. Chir.,' 1888.

been met with in cases of peritonitis after operation in man, and experiments upon animals show how the noxious effect of those micro-organisms may be assisted by extravasations in the peritoneal cavity, by long exposure of the peritoneum, and by damage to its delicate surface.

In the operation cases it is most probable that the streptococcus gains an entrance through the wound. In puerperal peritonitis it, no doubt, reaches the abdomen through the pelvic organs following the veins or lymphatics, or the Fallopian tube.

In the rare examples of peritonitis associated with erysipelas of distant parts (such as the face) the streptococcus must be assumed to reach the serous membrane through the blood.*

(3.) *Peritonitis Due to the Pneumococcus.*—This variety of peritonitis has not yet been so soundly demonstrated as to possess an indisputable existence. In the first place, the connection of the pneumococcus with pneumonia is a subject about which there is much conflicting evidence. In the second place, peritonitis is a very rare sequela to pneumonia, although is is true that pneumonia is not an uncommon complication of peritonitis.

The pneumococcus has been found in the peritoneum in a large number of the subjects of fatal pneumonia, and yet the serous membrane has remained sound. In 151 autopsies in which the pneumococcus was demonstrated, Netter† found only two cases of peritonitis.

However, cases of peritonitis have been reported by Weichselbaum,‡ Courtois-Suffit,§ Sevestre,|| Nélaton,¶ and Galliard,** in which the pneumococcus appears without doubt to have been the cause of the inflammation.

The peritonitis in some of these cases was primary, and was the sole disease, in the other instances it was secondary to ordinary pneumonia.

The pneumococcus would seem to be at one time noxious to the peritoneum, and at other times to be harmless.

* See case by Cheurlin, 'Thèse de Paris,' 1879.
† 'Soc. Méd. des Hôp.,' May 22, 1890.
‡ 'Central. für Bakt.,' January, 1889.
§ 'Soc. Méd. des Hôp.,' April, 1890.
|| *Ibid.*, May, 1890.
¶ 'Bull. Méd.,' October, 1890.
** 'Soc. Méd. des Hôp.,' November, 1890.

It is difficult to localise it in the peritoneum of animals by experiment.

Cultures obtained from the exudation in certain instances of peritonitis in which the pneumococcus was the only micro-organism found and injected into animals caused death from general sepsis.

Morisse,* whose monograph on this subject is by far the most complete, has collected eight examples of peritonitis in which, and in the associated lesions, the pneumococcus was the only micro-organism found. In seven of these there was either pneumonia or pleurisy. The exudation was purulent in five, and sero-fibrinous in three. Six of the patients died and two recovered. In both of these laparotomy had been performed.

(4.) *Tuberculous Peritonitis.*—This variety of peritonitis is not here dealt with.

(5.) *Peritonitis of a Doubtful Nature*—(*a.*) Peritonitis due to irritants. On the subject of this form of peritonitis there is much conflict in opinion. If its existence be established, then the existence of a non-infective variety of peritonitis has to be at once acknowledged.

Bumm† maintains that a non-infective peritonitis may be produced by mechanical, chemical, or thermal irritants, and states that it is usually plastic and localised.

Pawlowsky injected sterilised croton oil into the abdomens of 12 animals. Of this number eight died from hæmorrhagic peritonitis, and neither pus nor micro-organisms were found in the exudation, nor were there any signs of sepsis.

As a comment upon these experiments, it may be noted that pyogenic cocci (*e.g.*, the staphylococcus aureus) will act more readily, and in smaller doses if introduced into the peritoneum together with some corrosive fluid capable of injuring the serous endothelium, and further that such injury to the peritoneal surface —in cases in which no cocci are injected—encourages the escape of the colon bacillus from the intestine.

Fränkel injected Tr. iodi and Liq. ferri perchlor. into the peritoneum of certain animals. Peritonitis followed. If the exudation

* "Péritonite à Pneumococcus," Paris, 1892. See also an excellent article by Boulay, "Des Affections à Pneumococcus independant de la Pneum." Paris, 1891.

† 'Munchener med. Wochens.,' No. 42, 1889.

were examined at an early stage, or in the slightest cases, it was found to be clear and free from micro-organisms. If, however, the case were advanced, the exudation was purulent and swarming with bacteria which had passed through the bowel wall.

A like explanation would appear to be adapted to an experiment by Thompson,* who found that a piece of wadding dipped in 1 in 1,000 solution of corrosive sublimate and placed within the abdomen caused in some animals a fatal peritonitis.

Jalaguier† showed that tampons of sterilised gauze introduced into the peritoneal cavity of dogs caused no symptoms and no reaction, and when the animals were killed at the end of some months the gauze was found rolled up in a ball and encapsuled by adhesions. It was made evident, moreover, that it needed a foreign body of a certain size to even excite adhesions.

Fæces, if introduced into the peritoneal cavity, cause peritonitis, not by chemical action, nor as an irritant, but by reason of the micro-organisms or their products contained in the extravasation.‡ If the material be sterilised no effect follows. Fresh filtered fluid from the bowel caused, when injected into the abdomen, a fatal peritonitis in the exudation of which the bacterium coli commune was found. The same fluid when filtered through many layers of gauze produced abdominal symptoms, but all the animals lived. When the fluid was sterilised it had no effect.

The same results have attended the injection of human bile into an animal's peritoneum. When the bile was untreated peritonitis usually followed, but when it was sterilised the injection was attended by no evil results.

According to Naunyn,§ normal bile is sterile. According to Létienne,|| it may contain bacteria. It is said by others to be sterile so long as it contains free biliary acid.

In inflammatory conditions of the bile passages the bacterium coli commune is commonly found.

Lähr¶ has shown that in man a considerable effusion of bile

* 'Central. f. Gyn.,' January 31, 1891.

† 'Gaz. Hebdom.,' 1892, p. 161. See also a case by Michaux, 'Bull. et Mem. Soc. de Chir.,' April, 1893.

‡ Ziegler, Pawlowsky, Reichel, and others.

§ 'Deutsche med. Woch.,' 1891, No. 5.

|| 'Arch. de Méd. exper.,' t. iii, p. 761.

¶ 'Schmidt's Jahrb.,' 1890, t. iii, p. 235.

may take place into the peritoneal cavity without causing peritonitis.

Blood is not of itself capable of producing peritonitis, although it affords a very favourable condition for the development of any bacteria which may gain access to the extravasation.

This fact may be considered to be proved by the experiments of Penzoldt,* Cornil and Ranvier,† and others, and by the operation of peritoneal transfusion of blood performed on man by Ponfick,‡ Golgi, and Raggi.§

Orth‖ believes that it is possible to set up peritonitis by injecting a large quantity of blood into the cavity. He considers that it induces inflammation not so much through the action of bacteria as through the development of some fibrin ferment. Mr. Herbert Page¶ has published three very interesting cases of peritonitis from hæmorrhage, but it is evident from the reports that the peritonitis was of very slight degree and of very secondary importance.

A consideration of the whole matter leads to the conclusion that the production of peritonitis by non-infective irritants has not yet been satisfactorily proved.

(*b.*) Spillmann and Ganzinotty** have collected 15 recorded cases of rheumatic peritonitis with nine deaths. In some of these cases the peritonitis appeared alone, in others in association with rheumatic troubles in the joints, or in other serous membranes.

The evidence, however, upon which the pathological assumption depends is by no means satisfactory, and will not stand a critical examination.

Peritonitis has been met with in association with gonorrhœa; but inasmuch as the gonococcus will not survive in the peritoneal cavity, it is to be assumed that pyogenic cocci have found a nidus in the discharge from the genitals, and have spread by extension to the peritoneum.

Interesting articles on this subject have been published by Horowitz,†† Menge,‡‡ and Wertheim.§§

* 'Deutsch. Arch. f. klin. Med.,' 1876.
† 'Soc. de Biol.,' 1871.
‡ 'Berl. klin. Woch.,' 1879.
§ 'Gaz. des Hôp.,' 1880.
‖ 'Centralblatt für Chir.,' 1889, p. 849.
¶ 'Trans. Clin. Soc. Lond.,' vol. xxv, 1892, p. 172.
** "Dict. Encyclop. des Sc. Méd.," Article "Peritonitis," Paris, 1887.
†† 'Wien. med. Wochens.,' 1892, No. 2.
‡‡ 'Zeits. für Geburts. und Gynäkol.,' 1891, vol. xxi, p. 19.
§§ 'Central. für Gynäkol.,' 1892, No. 20.

The peritonitis reputed to be due to Bright's disease, to alcoholism, and to syphilis, has not been shown to have a specific etiological existence. It would seem rather to occur under conditions which are very favourable to bacterial growth, or to be due to extension from parts which are already inflamed. The subject is fully dealt with in the monograph by Spillmann and Ganzinotty, to which reference has already been made.

(*c.*) The peritonitis met with in the newly born appears to be due to one of two conditions. It may depend upon puerperal infection, and be brought about by direct extension from the cord, which is found to be inflamed or gangrenous, or the seat of an actually erysipelatous condition. Or it may be due primarily to the giving way of the bowel in cases of imperforate anus, or to that rupture of the normal sigmoid flexure which has been assumed by Zillner* and Generisch† to be due to direct pressure on the bowel during parturition.

For some fuller account of non-infective and of chronic non-tubercular peritonitis, reference may be made to special articles by Schroeder‡ and Strumpel.§

LECTURE III.

The Clinical Features and Treatment of Peritonitis.

The Clinical Features.—The general symptoms of peritonitis are so well known, and have been so precisely described, that they call for no special consideration in the present lectures. It will be necessary only to deal with the characteristics of certain individual symptoms, and to define the clinical peculiarities of certain varieties of peritoneal inflammation.

(1.) *The Nervous Phenomena.*—The general arrangement of the nerve supply of the parietes of the abdomen and of the abdominal viscera is somewhat peculiar. The skin over the greater part of the abdomen, over that part at least beneath which lie the chief

* 'Virch. Archiv.,' Bd. 96, p. 307.
† *Ibid.*, bd. 126, p. 485.
‡ 'Zeitschrift für Geburt. und Gyn.,' 1886, p. 493.
§ 'Gen. Path.,' Leipsig, 1885.

viscera, is supplied by the lower seven dorsal or intercostal nerves.

The same nerves supply the muscles of the belly, viz., the rectus, the two oblique muscles, and the transversalis.

More than that, these identical nerves take a most important part in the nerve supply of the abdominal viscera and of the peritoneum.

There are certain great nerve centres within the belly, with which the sympathetic is conspicuously concerned, and from which the organs of the abdomen are supplied.

The chief of these centres are the solar, the cœliac, and the superior mesenteric plexuses, and it is most noteworthy that the contribution they receive from the spinal nerves is derived in whole or in greater part from the lower seven dorsal nerves through the splanchnics.

It is further to be observed that these particular spinal nerves are concerned in the movements of respiration, since they supply the lower series of intercostal muscles.

It thus happens that an arrangement exists for the most rapid possible conduction of reflex impulses. A cold hand is laid upon the abdomen, or a blow upon the part is threatened, and the muscles of the belly wall become rigid in a moment, or it may be that there is some sudden lesion of the peritoneum or of one of the abdominal viscera, and at once the muscles of the belly wall contract, and a more or less marked hyperæsthesia of the skin develops, and there is thus provided by the tender integument and by the rigid muscles that protection and that securing of rest which are the first elements in the natural treatment of a damaged part.

Absolute rigidity of the belly, a limitation of the abdominal respiratory movements, and a tenderness of the surface are among the very earliest symptoms of acute trouble within the abdomen. The tenderness of the belly wall is often excessive, and depends upon an actual hyperæsthesia of the surface rather than upon a tenderness within the abdomen. In some cases the hyperæsthesia is so extreme that the patient cannot bear the touch of the lightest hand, and is even afraid to allow the bedclothes to come in contact with the skin of the abdomen.

The rigidity of the belly and the sensitiveness of the surface vary within considerable limits, and are most marked in cases which are

sudden and acute, and especially in those in which the peritoneum at the time of the outbreak was perfectly normal. The nerve condition of the individual has also to be taken into account. In chronic cases, in cases complicated with ascites, and in instances in which a sudden trouble falls upon a peritoneum which has long been exposed to irritation, the phenomena may be little marked.

In certain examples of perforative peritonitis the contraction of the belly wall may be so extreme that the parietes sink in and appear almost as if resting upon the spine.* This great retraction of the belly is comparable with that sometimes met with in lead colic. It has been for the most part noticed in connection with perforation of the stomach.

As peritonitis advances, both the hyperæsthesia of the skin and the contraction of the belly wall lessen and may almost entirely pass away. As the muscles yield, the phenomena of meteorism usually appear, and any tenseness of the abdomen which remains depends upon flatulent distension of the intestines. As soon as general septic symptoms become marked, both the contraction and the tenderness usually disappear. I have seen two cases of septic peritonitis due to trouble in the appendix run their entire course with a flaccid belly wall, and with scarcely any tenderness. Both patients were men over 50; no morphia had been administered, and death took place from toxæmia within seven days in both instances. One man spent some hours in applying massage to his own abdomen, and the other drew frequent attention to the absence of tenderness by slapping the abdominal wall.

That pain which the patient feels to be actually situated within the abdomen has the peculiarity that it is not as a rule to be localised at first, but is commonly referred to the great abdominal nerve centres. In the early stages of strangulated hernia or of perityphlitis, for example, the patient very often refers the pain to the region above the umbilicus, and will sometimes place his hand or his finger exactly over the site of the solar or superior mesenteric plexus. I have known the pain in perityphlitis to be referred at first to the opposite or sound side. As symptoms progress the localisation of the pain becomes usually more and more precise, assuming that the trouble still remains to a certain extent local. A patient who has had many attacks of perityphlitis gives a very

* Rullier, 'Arch. Gén. de Méd.,' t. ii, 1823, p. 380. Ebstein, 'Zeit. für klin. Med.,' Bd. ix, 1885, p. 209.

hazy account of the situation of the pain in the first outbreak, but as time advances he often puts his finger directly over the diseased appendix. I have noticed the same phenomenon in intestinal troubles due to limited adhesions. The pain may be at first "all over," or be referred to the median line a little above the umbilicus. In due course, however, it becomes more and more accurately localised.*

Into the great question of the physiology of peritoneal shock I have no intention of entering. Certain symptoms which are collectively known as the phenomena of shock, mark, almost without exception, the clinical beginnings of those cases of peritonitis which are abrupt in their onset or acute or even subacute in their course. These symptoms are evidently entirely due to an impression upon the nervous system, and are independent of inflammation on the one hand or of septic intoxication on the other. Certain experiments by Reynier and Richel† may be mentioned as illustrative of this statement. They injected boiling water into the peritoneal cavity of a rabbit. The phenomena of shock were at once produced, the temperature sank to 29° C., and the animal died, collapsed, within 24 hours. The more extensive the scald the more marked was the shock. In no case was any peritonitis produced. The injecting of perchloride of iron led to like results. There was no pulmonary congestion, and no formation of clot in the heart, and no peritonitis. If before the injection a nerve sedative, such as chloral, was administered to the animal, it would live for 24 hours instead of dying at the end of 6 or 10 hours.

In the human subject the shock attending a severe peritoneal lesion may prove fatal, and the patient may die with evidence of no important disturbance other than that wrought directly through the great nerve centres. The signs of sudden and grave disturbance of the peritoneum are—pain, profound exhaustion, a distressful anxiety, pallor, a small, soft, quick pulse, cold extremities, shallow respiration and vomiting. These phenomena vary in degree, and are not absolutely invariable. They often mark the earliest symptoms of an acute and suddenly produced peritonitis, or rather indicate the occurrence of a lesion which will lead on to peritonitis. It is interesting to note that these symptoms are, in some degree, common to *all* cases in which there has been a rude

* See some cases by Lauenstein. 'Archiv. für klin. Chir.,' 1892, p. 120.

† 'Comptes Rendus,' 1880, p. 1220.

and abrupt impression made upon the nerve centres within the abdomen. It may almost be said that all quite acute troubles within the abdomen commence with the same train of symptoms. A student who is well versed in the rigidly formulated signs of abdominal lesions as given in text books is surprised to be told that until many hours have elapsed it is often impossible to say whether a sudden abdominal crisis is due to the perforation of a vermiform appendix or to the bursting of a pyo-salpinx, or to the strangulation of a loop of intestine, or to the passage of a gall stone. The twisting of the pedicle of an ovarian cyst has led to symptoms which have been mistaken for perityphlitis, a sudden peritoneal hæmorrhage has been confused with intestinal obstruction, and the rupture of a hydatid cyst has been diagnosed as a perforation of the intestine. It is quite possible—indeed, quite usual—for these various troubles to present at first symptoms which are common to them all, and which merely indicate that a shock has been communicated to the great abdominal nervous system. Often at first there are no differentiating symptoms. There may be features in the past history of the patient which indicate a diagnosis, but in the absence of such evidence the cautious surgeon is simply assured that some sudden emergency has occurred within the peritoneal area, and that he must wait for localising signs before he can offer a diagnosis. To these common phenomena of a crisis within the abdomen Gübler* has applied the convenient term of "peritonism."

In the symptoms which are associated with an actually advanced peritonitis it is quite evident that the nervous system plays a prominent part. A study of intestinal neuroses makes it easy to appreciate how important that part may be. Not only may colic and diarrhœa occur in instances in which there is no reason to suspect any actual intestinal lesion, but there are cases, more or less clearly proved to be neurotic, in which there were meteorism, fæculent vomiting, and even some signs of strangulation.† I have twice opened the abdomen in cases in which there existed the phenomena of obstruction of the colon, as shown by distension of the belly, vomiting, constipation, pain, and the

* 'Journ. de Thérap.,' 1877.

† Admirable articles on intestinal neuroses have been published by Stein ('Wiener med. Wochen.,' 1892, No. 20); Peyer ('Weiner Klinik.,' Jan., 1893) and André ('Gaz. Hebdom.,' 1892, p. 603).

appearance of visible coils of intestine. In neither instance was any evidence of disease discovered within the abdomen, and in neither case did the symptoms return after the laparotomy. Allusion may also be made to those cases of chronic diarrhœa which are readily cured by chloral or bromide of potash.

It is usual in peritonitis for the mental faculties to remain perfectly clear up to the very verge of death. Among the 100 hospital cases already alluded to, there were only 11 examples of intense headache or delirium. In all of these a fatal result ensued. An examination of the clinical details in these 11 cases does not reveal any common train of symptoms. They were for the most part acute cases, but by no means the most rapidly fatal, nor were they of necessity associated with high fever or severe symptoms, or the administration of unusual doses of opium. The ages of the 11 patients varied between 9 and 53 years.

A rigor does not often mark the commencement of peritonitis. Among the 100 cases this symptom was recorded in 13 instances. In two of these the peritonitis had started in the appendix, in one it followed laparotomy, and in 10 it had its origin in the pelvis. Of the 13 patients 10 died.

(2.) *Meteorism.*—The degree of meteorism met with in peritonitis varies considerably, and is influenced by conditions which are not yet fully understood. When it exists its appearance is coincident with that relaxation of the abdominal muscles to which allusion has been already made. Meteorism may be absent throughout the whole progress of the case, and examples of this are not uncommon in instances of septic intoxication attended with symptoms of a low type. It is most marked in peritonitis attended by actual intestinal obstruction, in examples of perforation, in cases in which there is thrombosis of the mesenteric vessels, and also in instances in which opium has been freely administered. It appears to present no definable relation to the amount or degree of the vomiting. In experiments in which artificial distension of the gut has been brought about, not only do all intestinal movements cease, but peristalsis cannot be induced by any of the usual irritants.

It has been often assumed that meteorism depends upon obstruction in the lumen of the bowel, and that it is due to an accumulation of gases in the intestine above the occluded point. These assumptions are not supported either by clinical experience or by

experiments upon animals. It is true that the distended gut is entirely paralysed, and that it remains "paralytically fixed" in the abdomen; but even when actual obstruction exists it cannot be shown that the meteorism is the greater the lower down in the tube the occlusion is placed. In some examples of peritonitis not a little of the swelling of the belly depends upon distension of the stomach.

The elaborate and varied experiments of Kader* and others make it evident that gas may be developed in an intestine emptied of its contents, and that meteorism, as met with in disease, depends almost entirely upon gross disturbances in the circulation of blood through the affected portions of intestine.

The series of experiments which bears most directly upon peritonitis is the following. The lumen of the gut is not occluded, but the circulation in a certain segment is controlled by a ligature applied at the root of the mesentery. The blood supply to the bowel is very greatly reduced, but is not entirely cut off. The whole of the intestine so treated becomes rapidly distended with gas, and a condition of widespread meteorism is produced. The animal exhibits the symptoms of severe pain, with vomiting and diarrhœa, and death results with varying rapidity.

Diffuse peritonitis favours the development of general meteorism in cases in which an artificial strangulation of the bowel has been produced.

It may be convenient here to mention that the following gases are normally found in the alimentary canal, viz., O, N, CO_2, CH_4, H_2S. The first three named are believed to be swallowed as air. CO_2 may originate in the stomach as a result of digestive disturbances. CH_4 and H_2S are normally met with only in the colon. The following are the results obtained by Bokai† by introducing these various gases into the intestinal canal of animals through a hollow needle. N has no effect. O causes the movement of the bowels to cease. CO_2 causes violent intestinal movements, and finally paralysis, if the action of the gas be prolonged. CH_4 and H_2S produce also vigorous movements of the bowel. Bokai believes that the purgative action of sulphur depends upon the liberation

* 'Deutsch. Zeit. für Chir.,' 1891, p. 57. Other experiments are by Talma, Hessel, Karpetschenko, and Schweninger.

† 'Arch. für Exp. Path. u. Pharm.,' 1887, Bd. xxiii, p. 209.

of H_2S in the intestine, and that the sedative action of bismuth depends upon its chemically fixing the H_2S existing in the bowel.

It may be further added that fever artificially induced in rabbits by injecting decomposing matter under the skin causes a more or less complete paralysis of the intestine.

(3.) *Vomiting.*—It has been many times remarked that there is no single distinctive sign of peritonitis. Could one single symptom be selected as the one more usually present in all cases of peritonitis it would probably be vomiting. In the 100 hospital cases vomiting is noted as very slight in as many as 23 per cent. of the examples. In some of these it is described as absent. This may be to some extent explained by the strict rules of dieting which are more rigorously insisted upon at the present day, and by the fact that a dresser or a nurse may not record the symptom unless the vomiting be copious or very distressing.

By very slight vomiting is implied vomiting in which the amount actually brought up is trifling. Compared with the sickness attending intestinal obstruction, the vomiting in peritonitis generally may be spoken of as always slight. In a very large proportion of the cases which are carefully treated the patient will merely bring up a mouthful of fluid now and then. This is often accomplished with little effort, and many hours may elapse between the successive attacks. What is alarming and distressing in this slight degree of sickness are its persistence and the evil prognosis it suggests. The patient may be apparently improving, but there remains this periodical rejection of an ounce or so of fluid, which shows that the improvement is entirely delusive.

In some of the more insidious septic cases, and in such examples of peritonitis as occur in the aged or in the subjects of advanced visceral disease, the vomiting often amounts to little more than a slight irritability of the stomach.

In the instances in which the sickness is excessive, and in which the vomited matter becomes intestinal, there is something more than a mere reflex disturbance concerned.

Nothnagel,* Lüderitz,† Bokai,‡ and others, have described the manner in which an antiperistaltic action in the intestine may be

* 'Zeit. für klin. Med.,' Bd. iv, Heft iv, 1882.

† 'Virch. Arch.,' Bd. cxviii, 1889.

‡ 'Arch. für Exp. Path. und Pharm.,' 1887, Bd. xxiii, p. 209.

induced by exceptional irritation, especially such as acts directly upon the bowel itself.

The normal emptying of the stomach through the pylorus has been well described as a function of the intestine.

In the cases of peritonitis following upon strangulated hernia, the vomiting is for the most part very marked, and often copious, but it bears no constant relation either to the state of the gut, the degree of peritonitis, or the height of the fever.

In perforative peritonitis all symptoms are usually acute and pronounced. There is intense pain and a corresponding degree of collapse, and in the larger proportion of the cases vomiting is conspicuous. It is usually absent in examples of perforation of the stomach. In the cases connected with typhoid fever, the relation between the vomiting and the action of the bowels is notable. If all action of the bowels cease, then the vomiting tends to be marked; but if the loose motions are continued, then the sickness is for the most part slight. In the most rapid forms of perforative peritonitis, an actual inflammation of the serous membrane plays but little part. Death is from shock or acute general toxæmia.

In cases of peritonitis depending upon disease of the intestine, including mischief in the appendix, vomiting is not, as a rule, a pronounced symptom. In the cases of perityphlitis it is to be noted that it is least marked, as a rule, in the cases in which the bowels act with more or less regularity.

In peritonitis, taking its origin from the pelvic viscera or parietes, vomiting is seldom very distressing. In the acute cases the symptoms are rather those of septicæmia, and in the chronic cases the disturbance has a great disposition to remain localised.

In peritonitis following upon operation or accidental wounds, vomiting is rarely absent. It may not be marked, and may consist merely of an irritability of the stomach, but there it remains—a symptom which gives the greatest anxiety to the surgeon, and which no treatment appears capable of controlling. It may not be complained of by the patient, but, as already said, its gravity does not depend upon either its frequency or the amount ejected, but upon its deadly persistence.

(4.) *Constipation.*—Cessation in the action of the bowels is a conspicuous feature in peritonitis. The morphia which is often so very freely administered in this affection probably takes some share in the production of this symptom.

In the 100 cases of peritonitis from the London Hospital, the bowels are classed as "loose" in 28 instances. In some of these 28 cases there was actual diarrhœa, in others, the bowels acted with frequency, and without artificial aid, while in a third series of cases a free action was maintained by enemata, or by aperients.

In two cases of peritonitis following hernia in which diarrhœa was met with, it is noteworthy that the peritonitis did not appear until after the diarrhœa had set in, a circumstance which suggests the action of the colon bacillus.

In eight cases of perforative peritonitis, associated with a free action of the bowels at the time of the perforation (including four cases of typhoid) all passing of motions ceased in five examples when the lesion took place, while in the remaining three instances the bowels continued to act just as freely after the peritonitis began.

In these three cases the vomiting was much slighter, both in frequency and in amount.

In the 22 cases associated with disease of the appendix, there was constipation in nine cases (with four deaths), diarrhœa in four cases (with one death), while in the remaining nine examples the bowels acted naturally, or under the influence of enemata. In these nine cases there was only one death. It would appear, therefore, that—other things being equal—a better prognosis attends the cases in which the bowels are acting, and that a specially evil prognosis must be associated with the cases marked by absolute constipation.

(5.) *Lung Complications.*—In dealing with this feature of peritonitis, mere congestion of the lungs and a slight degree of bronchitis have been disregarded.

Among the 100 cases, there were no less than 17 in which pleurisy or pneumonia appeared after the peritonitis set in.

In the examples of peritonitis of intestinal origin, there were seven cases, viz., two of right pneumonia, one of left, one of right pleurisy, one of left, and two of right pneumonia with double pleurisy. Five out of the seven cases were in instances of peritonitis associated with hernia or perforation.

In the examples of peritonitis starting from the pelvic organs, or from sources outside the abdomen, there were 10 cases, viz., one of double pneumonia, two of right pleurisy, five of left pleurisy, and two of double pleurisy. In six of the instances the peritonitis

had commenced in the pelvis—a notable fact—and in the remaining four it was due to a wound of the abdominal wall.

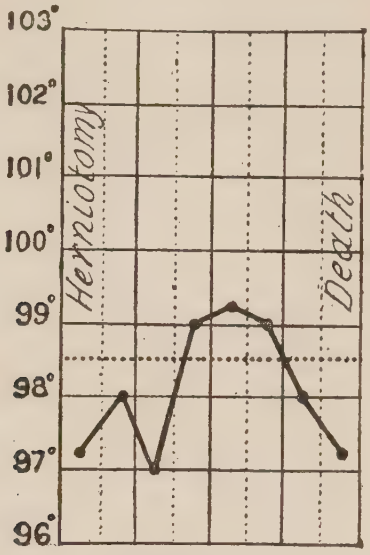


Chart No. 1.

Pneumonia after herniotomy has been supposed to be due to infective thrombi.

In two cases of pneumonia associated with gangrenous hernia, Fischer and Levy* found the colon bacillus and the staphylococcus albus in the hernial sac, and also discovered the same micro-organisms in the pneumonic patches in the lungs. Both patients died with peritonitis, and in the effusion in the abdominal cavity the bacterium coli commune was found.

The nature of the peritoneal exudation appears to have little bearing upon the lung complications, because in the 17 London Hospital cases, the peritonitis is described as commencing in three, as plastic in three, as sero-purulent in five, and as purulent in six.

(6.) *Fever.*—The temperature in peritonitis is liable to fluctuations so numerous and extreme that it is difficult, if not impossible, to deduce any type of temperature which may be considered to be characteristic of the disease. Probably there is no affection attended with fever in which the temperature charts of a large series of cases exhibit fewer data for the establishment of a common standard of fever.

A careful examination and analysis of the temperatures recorded

* 'Deutsche Zeit. für Chir.,' Bd. xxxii, p. 252.

in the 100 cases from the London Hospital makes it evident that the one symptom of fever can afford very little guide in estimating the gravity of the case, or in forming a dogmatic prognosis. A comparison of the temperature charts in the cases that recover with those that die leads only to a bewildering result. In some of the fatal cases the temperature has moved steadily upwards, in

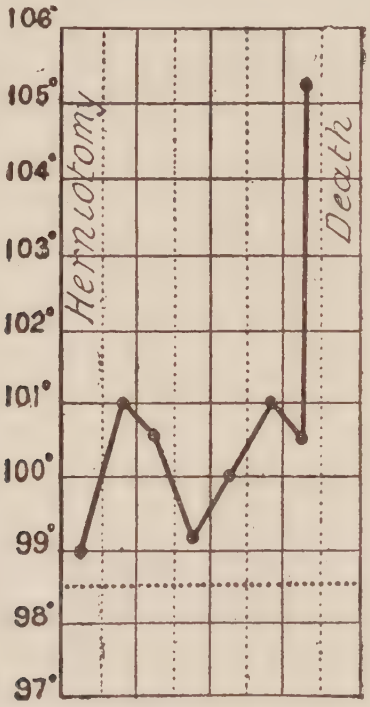


Chart No. 2.

others it has moved steadily downwards, in the third series of cases an even line of high fever has been followed, while in a fourth set of instances the temperature has been about or below normal. It is quite evident that no marked or regular relation exists between the range of temperature and the character of the peritoneal effusion.

In very general terms it may be said that perforation leads at first to a sudden drop in temperature, and that if the body heat be at the time high the onset of diarrhœa is associated with a more or less rapid diminution of fever. Moreover, it may be remarked that the chart record which carries with it the stamp of an almost inevitably fatal result is that in which the temperature is for consecutive days below normal.

The most robust evidences of fever are common in cases in which a plastic peritonitis, or one leading to well encapsuled

pus, is present; while the examples associated with a low range of temperature often mark the cases in which a general sepsis (as

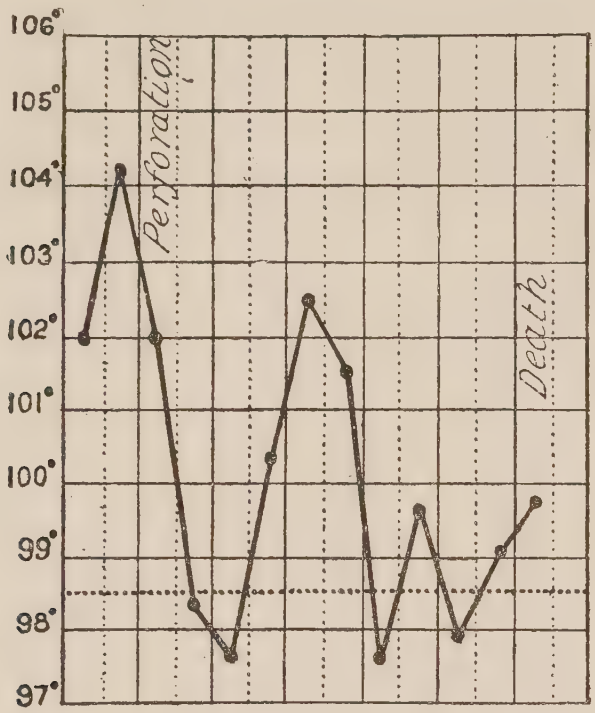


Chart No. 3.

from the intestine) is more pronounced than the peritoneal inflammation.

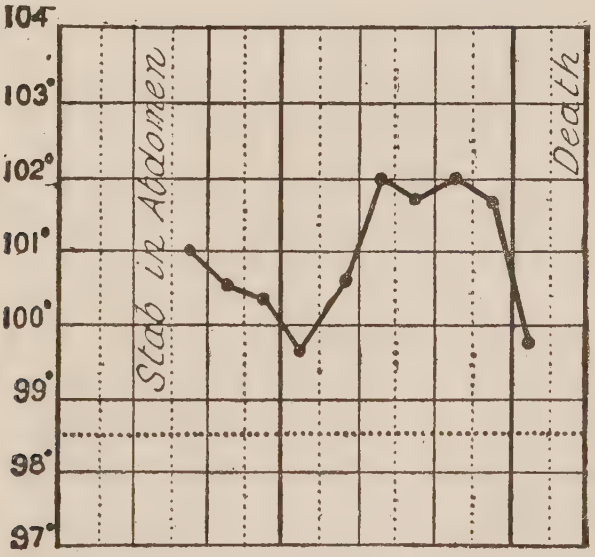


Chart No. 4.

The details of the temperature can best be illustrated by reference to the various forms of peritonitis.

In peritonitis due to hernia the temperature is for the most part

low, and does not rise in the majority of the cases above 99·5 . Chart No. 1 (from the case of a woman, aged 55, in whom a femoral hernia had been strangulated for three days before the operation) is fairly typical. In the autopsy the bowel was found to be slightly ulcerated. The other viscera were sound.

Before death the temperature in these—as in other marked septic cases—usually sinks lower and lower. Occasionally it may spring up to 105° just before death, as shown in Chart No. 2

Chart No. 5.

(from a case of ventral hernia strangulated two days in a woman of 35. The gut was black, but not perforated.) This sudden elevation of temperature has been ascribed by some to a disturbance of the heat controlling centres by the circulation through them of blood charged with septic matter.

In the hernia cases the temperature ran highest (99° to 102° or 103°) in those instances in which the gut reduced into the abdomen was practically gangrenous, or was extensively ulcerated. The onset of diarrhœa led to a fall in the temperature.

In peritonitis due to perforation the temperature in the most

rapid cases is that of collapse. If there be an existing high temperature at the time of the perforation, it may slowly sink, especially in cases in which the bowels continue to act freely, or may sink for a time and then rise again, as is commonly noticed in examples in which all action of the bowels ceases after the perforation. This is shown in Chart No. 3, from a lad of 19, with typhoid fever, and in whom perforation took place on the 18th day.

When the perforation is slowly brought about, the temperature may rise at first, and then sink slowly towards death.

Chart No. 4 shows the four-hour record of fever in the case of a lad of 18, who was stabbed in the abdomen, and in whom—after death—a small puncture in the ascending colon was discovered.

In peritonitis attended with gross disease of the intestine, the temperature is disposed to rise steadily, and then to drop somewhat abruptly before death. With actual gangrene of the bowel a high range of fever is common, and with profuse diarrhœa a lower range

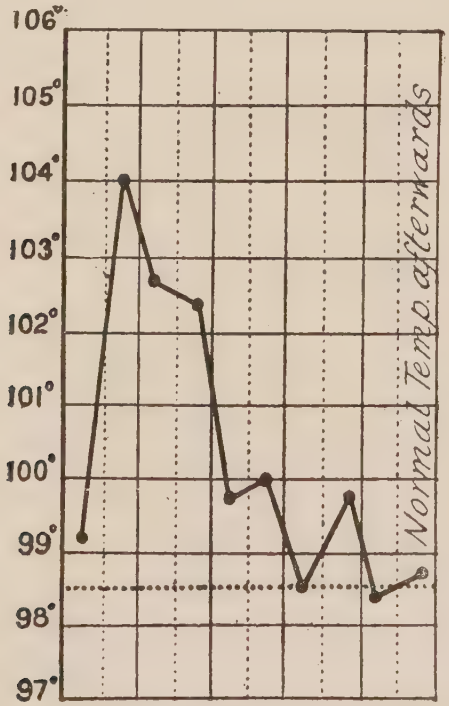


Chart No. 6.

Chart No. 5 belongs to the case of a woman, aged 49, with a growth in the descending colon, and ulceration of the bowel above it (there was no perforation). Peritonitis set in where the chart

begins. On the third day a copious diarrhœa began, and its apparent effect upon the temperature shows a common condition.

In peritonitis due to mischief in the appendix the fever is usually high and of the ordinary inflammatory type. Its average range is from 99° to 102° or 103°. Its duration varies greatly, and a lower range of temperature is generally met with in the cases attended by diarrhœa.

Chart No. 6 is from a case of perityphlitis in a man aged 44, in which the earliest symptom was diarrhœa, and in which the bowels were kept open throughout by enemata.

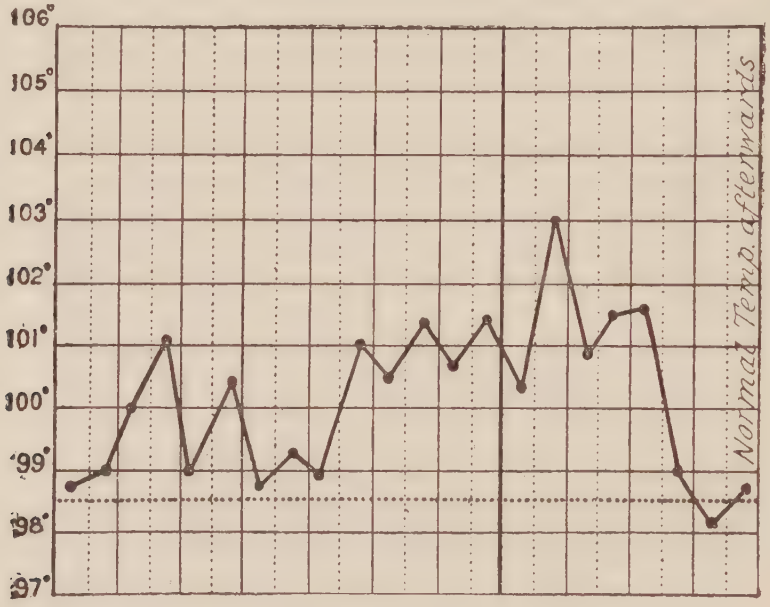


Chart No. 7.

Chart No. 7 is from a case of perityphlitis in a youth of 17, who was treated with opium, and in whom there was very marked constipation.

In peritonitis starting from the pelvis (with which is included puerperal peritonitis) the temperature is rather that of septicæmia. Chart No. 8 has been selected as fairly typical. It belongs to the case of a man, aged 53, who developed peritonitis on the seventh day, after a simple operation for fistula in ano. The trouble began with a rigor. The autopsy revealed a general sero-purulent peritonitis with septic thrombosis of the pelvic veins.

In examples of peritonitis following wound of the abdomen, the temperature is for the most part fairly high, running on an

average between 99° and 101° to 102°. In two cases from the London Hospital series it remained throughout below normal.

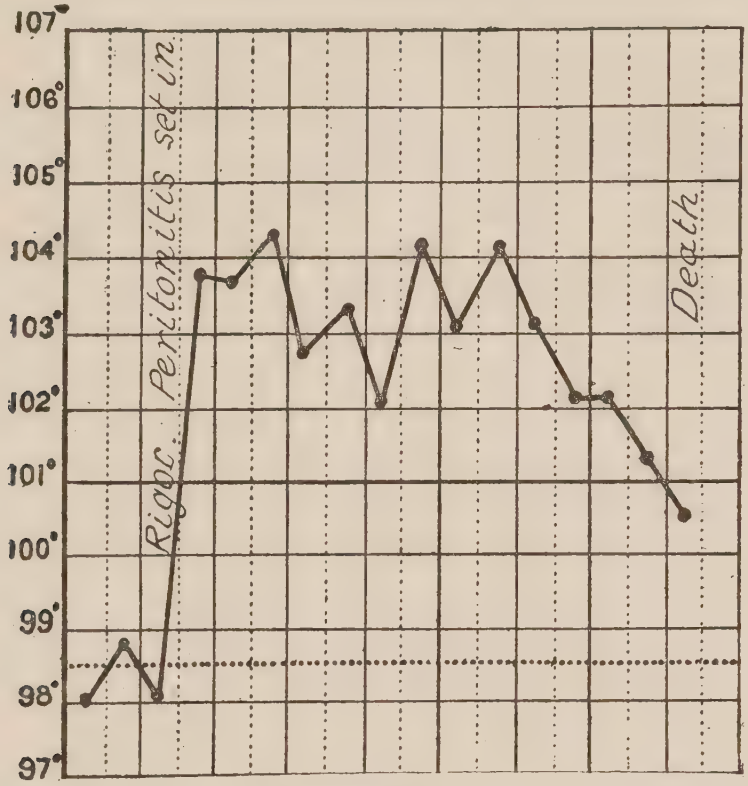


Chart No. 8.

Chart No. 9 is selected as an example of an uncomplicated case following laparotomy. The patient was a woman, aged 26. The operation consisted in suturing a hydatid cyst to the abdominal

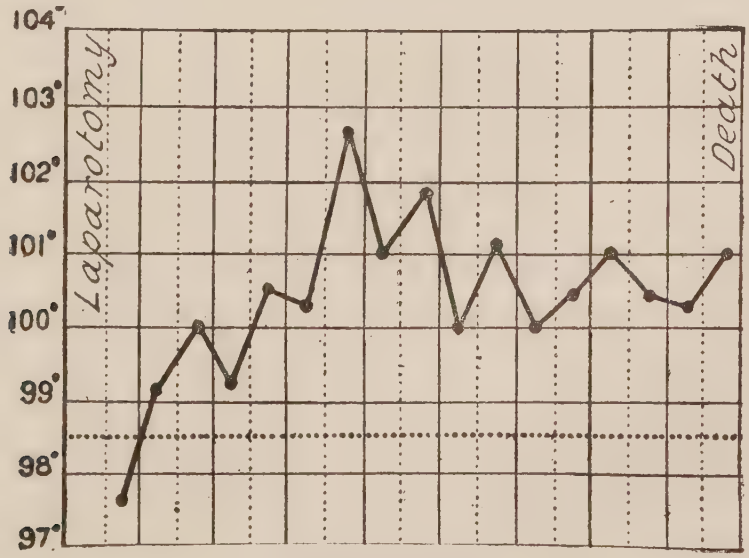


Chart No. 9.

wall. A general plastic peritonitis followed without any visceral complications.

The Treatment of Peritonitis.—Before dealing in detail with this matter, a very brief reference may be made to the treatment as carried out in byegone years. Inasmuch as peritonitis, as an individual disease, was not recognised until the beginning of the present century, even the most elaborate review of the subject cannot extend very far back.

An excellent account of the treatment of the disease as practised in England 80 years ago is to be found in a gossiping tract on 'Peritonitis,' by Thomas Sutton, M.D., late Physician to the Forces, and Consulting Physician to the Kent Dispensary.* His lines of treatment were as follows: first, absolute rest; second, purgatives: third, abstinence from food; fourth, cold to the abdomen; fifth, blood-letting in the acute cases; and sixth, opium to be given only occasionally and very sparingly. Dr. Sutton was not a believer in opium in peritonitis, except in the presence of intense pain. He made a great point of securing an action of the bowels when possible, and made frequent use of sulphate of magnesia.

Benjamin Travers, writing in 1812, advocated the same measures. He considered an evacuation of the bowels to be a matter of primary importance, but he appears to have relied largely upon enemata, and to have inclined towards warm fomentations.

The history of the surgical treatment of peritonitis is well given in the article on peritonitis in the 'Dictionnaire Encyclopédique des Sciences Médicales.' Its modern developments are too well known to need detailing. Some credit in the past must be given to Jobert, who, in 1836, advised that in peritonitis with effusion the abdominal wall should be incised, and water at blood heat injected. Guèrin, 10 years later, recommended a copious washing out of the abdomen in generalised puerperal peritonitis. The peritoneal fluid was, however, to be drawn off with an aspirator, and warm water injected and withdrawn until it came back clear.

In considering the treatment of any grave affection, it is well to recollect that certain of the so-called symptoms of a disease are not crass evidences of a disturbing evil within the body, but are

* London, 1813.

rather the natural expression on the part of the organism of an attempt to rid itself of a trouble. Many symptoms are, in fact, curative acts, and are the measures of a natural treatment, and not the mere purposeless signs of an unnatural disturbance.

The cough and expectoration in bronchitis afford a means of ridding the lung of the products of a catarrh, set up in the bronchi by some irritant. The photophobia and lachrymation in ulcer of the cornea serve to keep the inflamed part moist, and to protect it from the irritation of exposure and of light. The vomiting in poisoning has for its purpose the evacuation of the substance which has caused the disturbance. In any one of these cases the treatment consists, not in an attempt to suppress these symptoms, but in an endeavour to encourage them.

In peritonitis the exhaustion, the rigidity of the belly wall, the pain, the vomiting, and the not infrequent sense that the bowel needs to be emptied of flatus, would suggest the recommendation of attempts to obtain absolute rest, and, under certain circumstances, of means to relieve the intestine. If, in contemplating a patient with peritonitis, one could regard his more conspicuous symptoms as natural attempts to afford relief, they would appear to be in the direction of securing quiet within the enclosure of the abdomen, and of effecting an evacuation of the alimentary canal.

In the account which follows of the treatment of peritonitis, this suggestion from the therapeutics of nature is not disregarded.

(1.) *Rest.*—Absolute rest in the recumbent position appears to be the first obvious indication. The knees may be flexed over a pillow to lessen the tension on the abdominal walls, and to favour the patient's instinct to assume that posture. The upper part of the chest and the ever restless upper limbs should be protected by a woollen jacket, and no reasonable restraint offered to the patient's inclination to hold the hands above the head. This favourite posture, by acting upon the lower part of the thoracic wall, assists also in diminishing the tension within the abdomen. It is cruel to insist that the hands should be kept beneath the bedclothes. The state of misery in peritonitis is acute enough without being increased by purposeless and rigid formulæ. Cold hands do not cause death, but as on exposure they tend to become cold they should be covered up. The wretchedness of restlessness has a natural relief in little movements.

(2.) *Feeding.*—The old rule of 80 years ago of giving as little food as possible by the mouth cannot be improved upon. The stomach is not in a condition to receive nourishment, and what is taken usually remains unutilised, and is returned unchanged. The practice sometimes met with of laboriously plying the patient with teaspoonfuls of this meat extract or of that, recalls the legend of the Danaïdes, who spent their energies in pouring water into pitchers without bottoms.

In the matter of feeding there are two extremes to be avoided. The first is the rigid, unreasoning, and often needlessly cruel prohibition of food of any kind by the mouth, and the second is the reckless and intemperate use of ice, or iced fluids.

Thirst is often a most terrible symptom in peritonitis. It is not always quite relieved—at first, at least—by rectal injections. The patient is ready to give his life for a drop of cold water. If he takes it he is sick, but he is much relieved. This little indulgence does not introduce anew the symptom, of vomiting. It is there, but it is latent, and the drop of cold water only makes it evident. The patient will not die of vomiting, and simply because a rigid exclusion of all fluid by the mouth does not render the symptom apparent it does not render it non-existing. The man would sooner vomit than endure his thirst. Very often great relief is given by allowing a fairly copious draught of fluid, which is soon rejected, and which—as it were, by washing out the stomach—leaves the patient for a while infinitely comforted. On the other hand, the perpetual sucking of ice is as bad as the perpetual teaspoonful of useless jelly or of decomposible meat juice. The filling of the stomach with iced water does undoubtedly add to the general depression of the patient, especially when vomiting has been brought into abeyance by morphia.

The right course appears to lie between these two extremes. There should be no rigid formula except this—let the patient take as little food as possible by the mouth. If there be a raging thirst, let him have a little ice—and very little suffices—or a little iced milk and soda water, or if, as is common, the inclination lies towards something warm, let him take a few spoonfuls of hot water or of weak tea made hot, or of beef tea at a like temperature. It is not the nourishment that is needed (and I imagine that the nourishment in beef tea is merely an ancient but cherished fiction), but some fluid in the stomach.

It is better within reasonable limits to be guided by the patient's own instincts than by a blind formula founded upon a doubtful physiology. This same physiology has added very much to the miseries of death from peritonitis.

As regards actual feeding—in the usual sense—that should be carried out by rectal injections. The injections should be small in amount, should be weak, should be made of some peptonised meat extract or infusion, should be given slowly, and should be of the temperature of the body.

An injection of two to two and a half ounces of peptonised beef tea with half an ounce of brandy appears to answer well, and may be given every three or four hours. Thirst is better relieved by an injection of half a pint of warm water given alone, than by diluting the nutrient enema to that extent.

I do not think that nutrient suppositories are so well suited for cases of peritonitis as is the ready-made fluid injection. Irritability of the rectum may be to some extent met by washing it out now and then, and by a weak injection of cocaine. In the more advanced cases, the sphincter begins to relax as the loss of power progresses, and then very usually nothing can be retained. It is undesirable to harass the last hours of a dying man by nutrient enemata, simply because it is the custom.

If there be diarrhœa, or if the bowels be acting freely, then rectal feeding cannot be adopted, but fortunately in these cases, the vomiting is slight as a rule, and fluid and a certain amount of nourishment can be taken by the mouth.

It is, perhaps, needless to add that in cases—with or without diarrhœa—in which there is no vomiting, all that is given may be given by the mouth.

Much complaint is often made by patients with peritonitis, of the horrible state of the mouth. The tongue is dry and stiff, and such sense of taste as remains, is only capable of appreciating a bitter nastiness. Something can be done to relieve this by keeping the teeth brushed, by washing the mouth out with a 1 in 80 carbolic lotion, or with a mixture of Eau de Cologne and water, by actually cleaning the tongue and by keeping it moist with glycerine and water.

(3.) *Opium.*—Here again the old practice appears to be the best. Give as little opium as is possible. In the early stages of acute peritonitis, and especially in the perforative forms, and in those

depending upon appendix troubles, morphia in the form of a hypodermic is absolutely necessary. In the worst instances, it may certainly avert death from shock. Under its influence the patient revives, and the more intense symptoms become greatly modified.

Morphia should never become a feature in the routine care of peritonitis. It masks the symptoms, hinders the natural process of cure, and hampers treatment.

The indication for it is actual pain, and not mere restlessness and misery. In the really septic forms but very little morphia is called for, and often none at all. Its evil effect in the after treatment of cases of abdominal section has been amply demonstrated.

In quite hopeless cases, there can be no objection to its freer employment, but in other instances the administration and the dose of the drug must be sanctioned and measured by the one symptom, pain.

I have noticed that in those who are dying of general peritoneal sepsis, a greater sense of relief usually follows the hypodermic injection of strychnia than attends the use of morphia. The strychnia appears to act as a stimulant would—the patient revives for a while, and feels more hopeful under its influence, his moanings cease, his miseries are less unendurable, and for the twentieth time he thinks he may get better.

(4.) *Aperients.*—At the commencement of the century the use of aperients was a necessary element in the routine treatment of peritonitis. By aperient treatment may be understood the obtaining of an action of the bowels by either drugs or enemata. After a certain number of years the practice altered, and the dictum went forth that when any signs of peritonitis were present, aperients were to be absolutely forbidden.

Within the last few years the more ancient method has been revived, but it has been revived with very radical modifications. To Mr. Lawson Tait the profession is indebted for this return to an almost forgotten practice, and above all for the employment of that practice with the new element of discrimination. Mr. Tait's measure has been frequently spoken of as "the treatment of peritonitis by aperients," and it has been assumed by some—and probably with disaster—that a purgative is necessary in every case of peritoneal inflammation. Mr. Tait's precise words on this subject are as follows :—"I have never said that the purgative treatment will cure peritonitis, for peritonitis, once it is completely esta-

blished, is a practically incurable disease, and almost uniformly fatal."*

It is on this very point that the centre of the position with regard to this treatment turns.

Aperients can never be adopted in the routine treatment of peritonitis. In the larger proportion of cases this measure is entirely useless, and in the great series of the septic forms it is more or less impracticable.

In most of these septic examples enemata of any kind may be administered, and purges of any character may be given, and the probability is that the bowels will not act at all, and if they do respond it is more than probable that the treatment will not affect the prognosis in the least, and certainly not in the patient's favour. If the aperient could eliminate the fatal poison which is circulating in the patient's system, then good may follow, but even the most enthusiastic advocates of purging cannot credit their drugs with this power.

There is no doubt but that there is within the intestine an amount of noxious or poisonous matter which remains harmless so long as the viscus retains its normal condition, but which may lead to septic symptoms if certain changes are induced in the wall of the bowel, or possibly in its contents. This has been especially shown in connection with the potentialities of the colon bacillus, and it is clear that these noxious elements include, not only simple chemical substances, but also various micro-organisms and their hurtful products.

Equally evident does it appear to be that the injurious matters within the disordered bowel can, within certain possibly narrow limits, be got rid of by the action of aperients. In acute intestinal strangulation death may follow in a few days. The patient in such case dies neither of pain, nor of vomiting, nor of the obstruction to his bowels. After his death there may be found no signs of peritonitis, or evidences only of the slightest form of that condition. He dies of general septic intoxication, and the poison is derived from his intestine.

This poison is rendered potent by the abrupt and gross changes which the strangulation has produced in the intestine. Mere retention of the contents does not explain the disastrous results. In examples of chronic obstruction, the bowels may not act for

* 'Brit. Med. Jour.,' November 12, 1892, p. 1050.

six or eight weeks, and yet the patient may recover. The subject of a constipation of this degree will, it is true, exhibit some signs of poisoning. He is languid and apathetic, he vomits, the taste in his mouth disgusts him, he has headaches, his breath is rendered intensely offensive by reason of the matter, probably gaseous, which has been absorbed from his intestine, and is to some extent discharged from the blood through the lungs.

Some gross disturbance in the complex mechanism of the bowel wall is needed to render the poisonous contents of the intestine acutely poisonous, and to favour its ready introduction into the system. Of the effect of a thorough evacuation of the alimentary canal in such an instance, surgical experience can testify.

Such a case as the following must have come within the knowledge of every surgeon who has dealt with many cases of intestinal obstruction.

Some years ago I was called to see a vigorous man of 45, who had suffered from acute intestinal obstruction for some three days. I opened the distended abdomen, and I recognised that peculiar faintly stinking peritoneum with which such operations soon make one familiar. Immediately beneath the incision was revealed a single omental band, which had caused the trouble. This was divided, and the abdomen was closed. The operation lasted a few minutes. Still the man died, and the autopsy revealed no perforation, and no gangrene of the bowel, and no abnormal change in the peritoneum save a little stickiness. The patient died, not because his bowels were obstructed, but because that obstruction allowed septic matter to be absorbed from his intestine. His trouble was not outside his bowel, but within it. Had I made an opening in the gut, and allowed the poison-loaded viscus to relieve itself, the result may have been different. Such an operation would have been comparable to the washing out of the stomach after an active poison had been swallowed.

It is a fact that the most successful treatment of acute obstruction of a certain grade is that which provides for a thorough evacuation of the loaded gut. A blindly executed enterostomy, with an utter ignoring of the cause of the obstruction, has been attended by better results than have operations in which the agent of the obstruction has been discovered, after elaborate search, and has been satisfactorily dealt with. This treatment of acute obstruction by the evacuation of the bowel before all things, we

owe to Benjamin Travers, the father of intestinal surgery. In cases of strangulation of a certain degree, he insisted that the bowel should be cut into and emptied, even after the obstructing band had been removed. He considered that the operation was not complete until this had been done; he urged that safety was only to be obtained by an evacuation of the gut, and he supported his views by numerous cases and experiments.

Another illustration of these selfsame points is afforded by perityphlitis. In a previous section of these lectures I have shown that those cases of perityphlitis in which there is diarrhœa, or in which the bowels act naturally, or under the influence of aperients, are attended with a much lower mortality than are the cases in which constipation is marked. In my own experience I am convinced of the value of the aperient treatment in the earliest stages of these cases, and of the pursuit of the same measure throughout in selected instances. In some cases, however, nothing within reason will bring about an action of the bowels. The subjects of repeated attacks of perityphlitis are aware themselves of the evil effects of constipation, and many of them have learnt that they can ward off an attack or minimise it, when it comes, by a prompt aperient.

A further illustration of the subject from the same standpoint is afforded by that alarming intestinal condition which is sometimes met with after abdominal operations, and which was at one time spoken of as peritonitis. The exact nature of this condition was, I believe, first recognised by Dr. Malcolm.* It has been fully dealt with subsequently by Olshausen† and Verchère.‡ The former writer has applied to it the convenient name of "pseudo-ileus." The symptoms are these. On the second or third day after a not necessarily severe abdominal operation the abdomen becomes distended, the patient becomes uncomfortable, and complains of "wind." The distension increases; vomiting sets in. At first only the contents of the stomach are rejected; very soon the matter becomes bilious, and finally there is copious "coffee-grounds" vomiting, and this may present a feculent odour. The vomiting tends to become worse and worse, and is much more copious than is common in peritonitis. The pulse becomes smaller

* 'Med. Chir. Trans.,' vol. lxxi, 1888, p. 43.

† 'Central. für Gynæc.,' January, 1888.

‡ 'Revue de Chir.,' July, 1888.

and feebler, the temperature usually sinks, and exhaustion increases with alarming rapidity. On the fourth or fifth day after the operation the patient may die. At the autopsy the peritoneum may be found to be practically unchanged, or to exhibit so trifling a degree of peritonitis as not to account for the symptoms nor for the fatal result. Various explanations of this condition have been given. There is no doubt that the nervous disturbance which attends any abdominal operation leads to some degree of intestinal paralysis. This paralysis, attended as it is by vasomotor changes in the bowel wall, is favourable to the absorption of septic matters from the intestine. The paresis may be slight and may disappear spontaneously, or it may subside if the distension of the bowel can be relieved by the introduction of a rectal tube. If it persist it appears to permit of a filtration through the intestinal walls of septic materials, of bacteria or of their products. These latter are readily taken up by the peritoneum, and a septicæmia commences. This is the explanation given by Olshausen, Verchère, and others, but it is not accepted by Dr. Malcolm.

Anyhow, it was pointed out by Mr. Tait, and has been made evident to most surgeons who have followed his teaching, that if an action of the bowels can be obtained at the outset of the symptoms, either by the administration of a purgative or by an enema, the trouble in a large proportion of cases passes away, and the patient makes a good recovery. It cannot be said that this good result follows in all cases, and it is evident that the purgative, like the emetic given in acute poisoning, can only bring about an arrest of the symptoms within certain limits.

It only remains to point out that when once general peritonitis has established itself, an aperient is without avail. In those septic cases in which diarrhœa occasionally sets in, this is only too apparent.

An example such as the following serves to illustrate this point :—

A woman, aged 43, was seized with symptoms of acute abdominal trouble some hours after eating a very heavy meal. She was admitted into the London Hospital on the fourth day after the onset of the attack. She had then the symptoms of peritonitis. A laparotomy was performed, and an enterostomy was carried out without any attempt having been made to discover the cause of the inflammation. The patient died in two days, and before that time the bowel had entirely emptied itself through the artificial opening. The symptoms of peritonitis were in no way influenced, and I imagine that the patient's

death was neither hastened nor delayed. The jejunum was found to be gangrenous in two places, as a result of very acute enteritis. There was general peritonitis, but no perforation.

In conclusion, therefore, it must be said that aperients—in the ordinary sense—are of no avail in established general peritonitis. That in the peritonitis following hernia, or associated with acute intestinal obstruction, the complete evacuation of the bowel is desirable for reasons which are apart from the peritonitis.

In septic peritonitis—in the usual acceptation of that term—aperients are useless, and the same may be said of their employment in true perforative peritonitis.

In a large proportion of examples of perityphlitis, and in the pseudo-ileus which may follow after operation, the prompt evacuation of the bowels is often attended with the very best results.

On both theoretical and clinical grounds, the thorough emptying of the intestine before any abdominal section is performed may be regarded as absolutely essential.

(5.) *Blood-letting.*—This measure of treatment may with advantage be more extensively employed. It is no longer likely to be used in the unreasoning and mechanical fashion of bygone days. In robust forms of localised peritonitis blood-letting is attended with admirable results. In perityphlitis the application of half-a-dozen leeches often acts with magical effect.

In the older accounts of the treatment of peritonitis by bleeding, no good appears to have followed in cases in which the inflammation was diffused, except, perhaps in some examples due to injury. On theoretical grounds this is precisely what would be expected.

(6.) *Operative Measures.**—These are represented by incision and drainage, with or without irrigation. This treatment must be considered as it applies to peritonitis under two entirely different aspects. In one series of cases there is vigorous well-defined inflammation, the local symptoms are marked, pus is produced, and may be considerable in amount, and the exudation is more or less clearly localised. Examples under this heading are afforded by peritonitis started by mischief in the vermiform appendix, by many forms of peritonitis within the pelvis, and in the sub-

* The treatment of tuberculous peritonitis is not considered.

phrenic region, and by certain cases of limited inflammation following upon injury or perforation.

In the other series of cases the peritonitis is diffused, the constitutional symptoms are more prominent than the local ones, the changes in the serous membrane—so far as evidence of inflammation is concerned—are comparatively slight, and are out of proportion to the general disturbance. This form is illustrated by cases in which there is a general septic intoxication starting from the peritoneum, by peritonitis due to perforation, or following after strangulated hernia or enteritis, by puerperal peritonitis, and by examples of genuine peritonitis following operations upon the abdomen.

In the first series of cases surgical interference by incision and drainage ranks with the procedure of evacuating a large abscess.

In the second series the cut into the abdomen and the subsequent flushing out or drainage, are to be compared with the washing out of the stomach after an active poison has been swallowed.

In the one case the body has to be rid of the products of a robust and possibly limited inflammation; in the other case an attempt has to be made to remove from a cavity a poison which has already wrought no little harm. The operation in the latter instance is directed not so much against an inflammatory outbreak as against a progressive poisoning.

The operative treatment of suppurative peritonitis, especially when the effusion is localised, has been remarkably successful. Records of the operation extend back into the 18th century, and all that modern surgery can lay claim to is the application of the treatment with greater boldness, with greater frequency, and with infinitely less delay.

The operative treatment of general diffused non-tuberculous peritonitis has, so far, no record to boast of, and little progress to chronicle. I am doubtful if a single human life has been saved by surgical interference in a genuine case of peritoneal toxæmia. Surgical treatment has been most discouraging in acute peritonitis following upon gangrenous hernia, upon operation, and upon puerperal infection. It has met with but little better results in cases of perforation, in which the serous inflammation has been well established.

The somewhat imposing lists of cases of success after lapar-

otomy for acute suppurative peritonitis, afford sorry matter for congratulation when submitted to a careful scrutiny.

The following may be cited as illustrative of this :—Krecke* gives a list of 119 cases of generalised purulent peritonitis treated by operation, and attended with only 68 deaths. In 18 instances the cause of the peritonitis was unknown, and in 36 cases it was due to trouble in the appendix, and it is among these 54 examples that the greater number of the successes are to be found. All the cases of peritonitis associated with hernia, or with perforation of the stomach, died.

Steinthal† gives a list of 20 cases of perforative peritonitis treated by operation. There were 10 recoveries, but in no less than seven of these cases the pus was encapsuled, and was apparently dependent upon perityphlitis. At least it is stated, that in 11 cases out of the 20, the perforation was in the appendix. Some of the cases are remarkable enough, but they are not examples of that form of generalised peritonitis which is usually associated with perforation.

Kaiser‡ has collected 30 cases of operation in perforative peritonitis, with 11 recoveries. In five of the examples of cure the locality of the perforation was unknown.

Körti,§ after pointing out the fallacy of statistics, and the fact that the successful cases are probably all reported, while the failures are commonly left in obscurity, gives a list of 40 consecutive cases operated upon by Mickulicz, Krönlein, and himself for purulent peritonitis. Out of this number there are 11 recoveries, and these include no less than seven cases of perityphlitis.

Kriege‖ gives a case of perforation of the stomach, which was treated successfully by an operation carried out 24 hours after the viscus was supposed to have given way, but in this instance there was no peritonitis. He incidentally alludes to six other recorded cases, all of which ended in death.

Some very excellent results have attended early operation for

* 'Munch. med. Woch.,' August, 1891.

† German Surgical Congress, 1888.

‡ 'Deutsch. Arch. für klin. Med.,' 1876, Bd. xvii. See also Siewe, 'Archiv. gén. de Méd.,' 1893, t. i and ii. Krönlein, 'Langenbeck's Archiv.,' Bd. 33, p. 507. 'Congrès Franc. de Chir.,' 1889, p. 197, and Mickulicz, 'Deutsch. Ges. für Chir.,' 1889, pp. 303.

§ 'Deutsch. Ges. für Chir.,' 1892, p. 131, 160.

‖ 'Berlin. klin. Wochen.,' 1892, p. 124.

injury of the bowel and other abdominal viscera, but these results cannot justly be considered in connection with laparotomy for fully established peritonitis.

As to the actual mode of operating adapted for the different varieties of peritonitis, I would venture to draw attention to the following points. In all cases it is to be assumed that the skin over the operation area is cleansed and prepared in a suitable way, and that the surgeon adopts those measures which students, in their examination papers, are so fond of describing as "strict antiseptic precautions."

In cases of localised purulent peritonitis an incision should be made into the collection by the most direct route. When the pus has escaped, a rubber drainage tube of suitable size and with stiff fenestrated walls should be passed to the bottom of the cavity. A dressing of some absorbent material, such as Tillmann's paper, sal alembroth, or cyanide gauze is then applied. I have seen no advantage attend either the fuller evacuation of the pus by squeezing, or the immediate irrigation of the cavity, and I am confident that distinct harm may be done by scraping the wall of the enclosure, by persistent searching for a diseased appendix or other cause of the trouble, and by stuffing the exposed space with a considerable quantity of gauze.

At the end of 24 or 36 hours the irrigation of the cavity may be commenced, and continued twice daily, and now and then a little iodoform emulsion may be introduced.

In some examples of perityphlitis a well encapsuled collection of pus is not exposed, but the knife enters into an ill-defined district containing a variable quantity of thin, greenish, and often offensive matter, which appears to saturate the tissues. In such circumstances, I have been in the habit of using a drain composed of strips of iodoform gauze, which are carefully introduced into the lowest accessible recesses of the region.

In cases of generalised peritonitis the procedure adopted must obviously depend upon the cause and degree of the trouble. If the exudation be serous it will suffice if the fluid be evacuated, if the peritoneal cavity be gently dried in its most dependent parts by means of gauze sponges, and if the abdomen be closed without drainage.

When the exudation is sero-purulent or purulent, it is in many cases desirable that the cavity be irrigated. The fluid which

appears to be best suited for this purpose is a sterile 0·6 per cent. salt solution made warm. The details of irrigation will be discussed later on. After the washing the depths of the peritoneal cavity are dried, so far as is possible, with sponges, iodoform powder (except in children) is dusted over the portion of the serous membrane most involved, a long, rubber, fenestrated drainage tube may then be introduced, and the abdominal wound be closed. Any treatment directed against the cause of the peritonitis will be independent of these measures. In the treatment of the ascitic forms of tuberculous peritonitis the best results have followed simple incision without either irrigation or drainage. The use of the rubber tube is apt to be followed by an obstinate sinus.

There are cases in which the peritonitis is more plastic in character. The intestines are found to be matted together with greyish lymph, which may be present in considerable quantity. The breaking down of these adhesions causes no little amount of bleeding, and such a step is evidently destructive of a certain desirable process of repair. Still, in order to search for the cause of the peritonitis, assuming such search to be indicated, and to set free an amount of exudation which is imprisoned between the attached coils, this freeing of adhesions must be to a certain, very limited extent carried out. There will probably be a sero-purulent exudation in the belly cavity, and the gentlest movements of the fingers among the recently attached intestines will set free more fluid, which will be probably less opaque. A clump of adherent intestines will often cover and protect a perforation, and the ubiquitous lymph will many times close such an opening with more speed and security than are provided by any system of suturing.

As the surgeon therefore reaches what appears to be the starting point of the peritonitis, he must proceed with the utmost caution, and be not only prepared, but rather inclined to leave the actual *fons et origo mali* undemonstrated. The main purpose of the operation is to allow a noxious exudation to escape, and, if possible, to free the peritoneum of the cause of its trouble. In the class of case now under discussion, a perforation will be very often the starting point of the peritonitis; the lapse of time and the plastic character of the inflammation afford evidence that the perforation is, for the time being, closed. If the operator can rid

the serous cavity of the effects of the perforation, he may very often leave the breach itself to be dealt with by natural means.

The wisdom of doing no more than is necessary, or as little as is obvious, is well illustrated by these cases. It is a very striking fact that some of the best results in the treatment of perforative peritonitis have been obtained in instances in which the exact site of the perforation was never ascertained. In Kaiser's statistics, already alluded to, there were six such examples, and of these five recovered.

In this form of peritonitis a liberal dusting of the serous membrane with iodoform should be carried out (except in cases in children). Drainage is seldom required, and when employed is best provided for by strips of iodoform gauze passed among the intestinal coils to the necessary depth.

Irrigation is certainly not suited to this class of case. Gauze mops or sponges in holders form the best means of clearing the peritoneum under the circumstances named.

It only remains to consider what means may be taken during the performance of an abdominal section to prevent the onset of peritonitis, and to discuss the two vexed questions of irrigation and drainage.

"The modern laparotomy," as Dodulein* presumes to call it in a recent elaborate paper, is a procedure which has evidently not yet reached the stage of recognised formulæ, nor attained to the position of a stereotyped process.

A perusal of the numerous writings upon the technique of the operation leaves an impression that the opening of the abdomen is still regarded with an almost superstitious awe, and is still approached by many with a fussy and meaningless ceremonial, that elaboration of detail may be carried to a degree which is merely fatuous, but that although surgeons differ greatly in their methods, they differ but little in their results.

It is impossible to avoid the temptation of pointing out that an infinitely elaborate technique is no substitute for lack of skill in operating, and that the power of the human body to resist the effects of injury is not capable of unlimited extension by artificial means.

It is needful, in the first place, that the operation room should be surgically clean, that the patient should be clean, and that the

* 'Deutsch. med. Wochen.,' May 25, 1893.

operator should be clean. The attaining of this end appears to be as satisfactorily accomplished by the charwoman, the laundress, and the nail brush, as by complex chemical processes.

There seems to be no imperative need that the operation chamber should be capable of being washed out in the same manner as the interior of a cup, nor do results show that it should be so constructed as to be convertible into a vacuum or so ventilated as to admit only a stream of sterilised air.

The skin over the abdomen can be prepared by a liberal scrubbing with soap and water, followed by washing with ether and the final application of a carbolic compress, which is applied some hours before the time fixed for the laparotomy.

Ligatures and catgut are, I think, best kept in an ethereal solution of corrosive sublimate. They can be dipped into sterilised water just before they are used.

The methods of rendering instruments surgically clean are legion. I adopt the practice of placing them in a 1 in 20 carbolic solution for 15 minutes previous to the operation. Just before they are used the solution is diluted with sterilised water until it represents 1 in 80 or 1 in 100 in strength. To take an instrument direct from a strong carbolic solution and use it within the abdomen, is to bring a caustic and damaging irritant into contact with the peritoneum, inasmuch as some of the solution must drop from the knife or forceps so employed.

Gauze sponges do fairly well for the peritoneum if properly prepared. They are best left to soak for some time in a 1 in 20 carbolic solution, which is very freely diluted with boiled water just before the sponges are passed through the roller.

Ordinary sponges in holders are better adapted for the depths of the cavity. As they are not readily cleaned after use they are burnt as soon as they have been once employed. This disposes of many uncertainties.

It is obvious that the less the peritoneum is touched, stretched, rubbed and handled, the better. Now and then it may be desirable to repair, with a continuous suture, any rent made in its surface.

I have tried every method of closing an abdominal wound of which I have had any knowledge. I believe the best plan is to steady and straighten the wound edges with blunt hooks while the needle is being passed; to sew up the peritoneum with a con-

tinuous suture of fine silk, and to close the rest of the parietal wound with a single row of silkworm gut sutures which embrace all the soft parts, excepting the serous membrane, and which are passed by means of straight needles.

Any damaged surface of peritoneum should be well dusted with iodoform, and into the ragged cavity left after the removal of an adherent kidney or a sessile tumour, a liberal quantity of the same powder may be introduced. I have reported certain cases which encourage the impression that some security against peritonitis is to be obtained by the free use of iodoform within the abdominal cavity.* Iodoform should not, however, be used in the case of children, as it is very apt to produce in them symptoms of poisoning.

It is needless to say that the peritoneal sac should be left as dry and as clean as possible; that all bleeding should be carefully arrested, and all clots, pus, cyst fluid, and the like, should be thoroughly removed. It is possible, however, that these ends may be attained at too great a cost, and that the "toilet of the peritoneum" may become a very uncouth and barbaric process. Within certain limits I believe it is often less injurious to leave some blood clot in the abdominal cavity than to persist in an obstinate determination to remove it at any sacrifice.

An ounce or so of cyst fluid in the peritoneal sac would I think do less harm than an attempt to complete the toilet of the peritoneum as carried out by a mechanically conscientious man. This toilet is often a Brobdingnagian affair, and when strong antiseptics and countless sponges are employed it degenerates into mere violence, and is rather of the nature of an assault. If the infinitely tender character of the peritoneum be held in mind, this toilet—as sometimes practised—is comparable to the removing of a foreign body from the eye by means of a scrubbing brush and plenty of washing soda.

This now leads us to the subject of irrigation.

Irrigation—Mere blood is better removed from the peritoneal cavity by sponging, than by irrigation.

If the operation area be well circumscribed by sponges, if the shoulders be raised so that blood will reach the more dependent tracts, and if a sponge be introduced into the pelvis at an early stage of the procedure, there is little trouble with blood clot.

* 'The Lancet,' June 10, 1893.

Coagulated blood is certainly very much more easily and certainly removed by means of gauze sponges, than by a stream of water. The same observations apply to what may be termed healthy cyst contents, to fluid from hydatids, to bile, and to matter escaping from the stomach or intestine. With careful plugging and a watchful use of sponges a widespread extravasation is uncommon.

If it does take place the gauze can usually reach it.

Irrigation would possibly have the effect of spreading the noxious fluid—as for example intestinal matters—over a still wider area.

It may be said, therefore, that if certain precautions be taken, the cleansing of the peritoneal sac may be best and most safely accomplished by dry sponging.

If there be a considerable outpouring of such a material as putrid pus, or if there be a copious escape of gut contents, as from the giving way of a distended bowel above a point of obstruction, then it may be better that the whole peritoneal cavity be irrigated. In such a case the amount of the extravasated fluid and its wide distribution would render its complete removal by sponging difficult.

This irrigation is best conducted by the following means. The fluid used is a sterile 6 per cent. salt solution at blood heat. It is introduced at low pressure but in a wide stream. The irrigating tube is of soft rubber and may have a diameter of three-quarters of an inch. The tube itself is introduced into the belly cavity. The flow through it can be regulated by a clip. Any form of rigid nozzle is to be most strongly condemned. The solution should flow gently into the abdomen. The peritoneal cavity is to be flooded and not to be scoured out with a violent stream of water, which hisses and rushes from a vulcanite nozzle as from a miniature fire-hose.

When the belly cavity is quite full of fluid the surgeon's hand —which is already in position—is moved to and fro among the intestines with great gentleness. The coils of bowel are thus rinsed. By a movement of the hand and by pressure here and there the fluid overflows from the wound and is replaced by the steady stream.

As the water which escapes becomes clear the upper end of the operation table is raised, so that the shoulders are much elevated, and then little has to be done but to wash out the most dependent

parts, including especially the pelvis, and to allow the upper parts to drain. Finally, what fluid remains in the pelvis is removed with sponges, and a sponge in a holder is retained in the bottom of the pelvis during the introduction of the stitches, and only withdrawn at the last moment.

In the actual process of irrigation it is important that the temperature of the fluid be constant, that the abdomen be never over distended, and that the stream be not directed against the diaphragm. If these precautions be neglected alarming dyspnœa and even asphyxia may take place.* If the shoulders be well raised—as already advised—these respiratory complications are less likely to occur. Polaillon has observed three cases of cessation of respiration in the human subject during irrigation.

Many surgeons have written of late on the subject of irrigation, and the general bias of these communications is very strongly against irrigation. Fluids of all kinds have been used, such as solutions of carbolic acid, of corrosive sublimate, of boric acid, and of salicylic acid. The two last named are the most in favour. Many operators employ boiled water, and not a few a weak preparation of alcohol.

It is evident that whatever fluid is employed, it cannot be used as a germicide, and that all that can be aimed at is a solution which is sterile and non-irritating.

It has been urged that irrigation serves to spread the infective material, which it is required to remove, over a wider area, and that it seriously diminishes the resisting power of the peritoneum. Reichel† strongly insists upon the latter objection. He found that in artificially produced peritonitis in dogs he was never able to ward off death in any case in which it was to be assumed that the animal if left alone would die. He introduced fæcal matter into a dog's peritoneum, and, having closed the wound, he re-opened it after a while and employed irrigation in some cases and sponging in others. He found neither method entirely successful in cleansing the serous cavity, but was convinced that sponging was the more efficient of the two. Even when from 10 to 15 litres of fluid was used a quantity of infective matter was still found to have been left behind. He irrigated the

* Delbet, 'Annales de Gynec.,' September, 1889. Reichel, 'Deutsch. Zeit. für Chir.,' Bd. xxx, p. i. Kinscherf, "Inaug. Dissert.," Heidelberg, 1892.

† *Loc. cit.*

healthy peritoneum in certain animals with boiled water. All the animals so treated recovered, but some were ill for a long time, and some had urgent dyspnœa. These simple irrigations produced a blood-stained exudation in the peritoneal sac, and many minute hæmorrhages into the intestinal portion of the membrane.

Lauenstein,* on the other hand, considers that irrigation is theoretically better than sponging, although he acknowledges that in practice he has not found the procedure attended with good results. He thinks that as much damage may be done to the peritoneum by determined sponging as by the irrigator, and in this he is no doubt right.

Into the peritoneal cavity of three corpses Pölchen introduced some fæcal matter 15 minutes after death. He employed immediate irrigation, and found that the material adherent to the bowel after the operation was sterile.

When flushing is employed so much fluid remains behind that some sponging becomes necessary.

Other things being equal, irrigation involves more time than the mopping out of the serous sac.

Stuehlen† is among the comparatively few recent writers who consider that irrigation can efficiently cleanse the peritoneum.

Kinscherf‡ has carried out a series of experiments which add an additional feature to this subject. He points out that a considerable quantity of fluid may be absorbed by the blood during irrigation, and that the amount may be such that the absorptive power of the peritoneum may be reduced to *nil*. He repeated Delpet's experiments, and irrigated the abdominal cavity of an animal for 10 to 20 minutes, with a 6 per cent. salt solution. He then introduced more sulphate of strychnia than was sufficient to produce tetanus in a control animal of the same weight. No effect followed.

Kinscherf used a 1 in 2,000 corrosive sublimate solution after the flushing process, and found that no symptoms of poisoning followed, although toxic phenomena were always produced when irrigation had not been previously carried out.

It is, of course, a matter of question how far experiments such as these can be used as arguments *ad hominem*, but of the unsatis-

* German Surgical Congress, 1888.

† "Die Drainage des Peritoneums," Wurzburg, 1890.

‡ *Loc. cit.*

factory results which have followed upon the indiscriminate use of irrigation after operations in man there can be no doubt. In not a few instances it would certainly appear that irrigation has hastened death.

Drainage.—It will be allowed by most that drainage is necessary, when either an actually noxious material is left in the peritoneal cavity, or when it is assumed that an extensive effusion will follow upon the laparotomy. Considerable differences of opinion must exist as to what constitutes, either in substance or in amount, a noxious material, and also to what extent a possible effusion is to be met by drainage. There seems little to commend the employment of a glass drainage tube passed into the fundus of Douglas' pouch. I have ceased to use this appliance, and it would not appear that it is used with any frequency by the majority of those who are much concerned in abdominal operations.

A stout rubber drainage tube of large size and well fenestrated, passed into the midst of the area which is the most disturbed, appears in most cases to answer all reasonable purposes. It is not suited for most tuberculous cases, and has, in many instances, been followed by an obstinate sinus. In any case the sooner the tube can be removed the better. It must be assumed that the surgeon has no objection after the operation to frequent, and perhaps extensive, changes in the patient's position, for the purpose of assisting the process of drainage. I have myself seen no harm arise from a liberal fulfilment of this object. In certain instances, some of which I have already indicated, a gauze drain appears to be better adapted for the case than a rubber one. This drain is simply composed of a long strand of iodoform gauze about $1\frac{1}{2}$ inches wide, and some five to six layers thick. It appears to have been first advocated by Bardenheuer. In a case of purulent peritonitis, Jalaguier* has passed these strands of gauze in all directions among the intestinal coils from the diaphragm to the pelvis with good result.

A like proceeding in like cases is advocated by Steinthal.†

The great objections to the iodoform drains are these. They may induce symptoms of poisoning if very extensively employed, they are most difficult to remove unless there be a free discharge, and their use is apt to be followed by ventral hernia. Iodoform

* 'Bull. et Mem. de Soc. de Chir.,' 1891, p. 800.

† German Surgical Congress, 1888.

tampons used to close a breach in the peritoneum which cannot be closed by sutures, involve much distress in their removal, and if left in for a few days may become quite covered in with lymph. If retained long enough to ensure a complete occlusion of the peritoneal cavity, their removal is not so difficult, but a hernia is almost inevitable. The so-called Mickulicz drain is an open bag of iodoform gauze, which is stuffed with strips of the same material. It is used when an actual cavity has to be drained, and the size of the tampon is often alarming. The bag is slowly evacuated, piece by piece, after the first 48 hours, and by the fifth or sixth day it is empty, and the gauze sheet itself is then removed. The cases must be few which call for the employment of this formidable tampon.

Some surgeons, either to supplement or to replace drainage, allow the wound to gape, or support it merely by a few quite loose sutures.* This measure has been especially advocated in the treatment of perforative or purulent peritonitis.

In conclusion, it only remains to be said that the surgical treatment of peritonitis has not yet reached a position which is either satisfactory or secure. There has been no lack of boldness in the measures used, and little sense of discouragement at the results obtained. Surgical enterprise has been directed against effects and against damage done, rather than against causes and the beginnings of evil. The surgeon holds the same position in regard to peritonitis which was held some 30 years ago in regard to wounds and more accessible forms of inflammation. At that time he dealt only with the consequences of pathological wrong-doing, just as now he concerns himself with the prevention of troubles which he has learnt to control. Peritonitis will be more successfully treated when measures can be directed against the sowing of the wind rather than, as now, against the curbing of the whirlwind.

* Mickulicz, 'Deutsch. Ges. für Chir.,' 1889, p. 303 ; and Krecke, 'Munch. med. Woch.,' August, 1891.

February 5th, 1894.

THE TREATMENT OF OVARIAN AND EXTRA-UTERINE CYSTS COMMUNICATING WITH THE RECTUM.

By Harrison Cripps, F.R.C.S.

With an experience of over 100 cases of ovariotomy, the four recorded below are the only instances of a fistula between the cyst and the rectum that I have met with, and it would be of interest to learn from more experienced operators whether this complication is as common as it has unfortunately been in my practice.

Case 1.—M. A., a nurse, aged 26, was invalided from the hospital in June, 1892, on account of persistent pyrexia (night temperature ranging from 101° to 102°). She complained of no pain, and the pelvis was not examined. Two months later she had considerable pain in the left iliac fossa, and soon afterwards noticed an enlargement. The pain increased, and became very severe during the first week in October. A sudden discharge of over a pint of pus then took place *per rectum*. Two days later, on examination, the abdomen was found distended and very tender over the left iliac fossa. No distinct tumour could be felt from above. *Per vaginam* the cervix was pushed over to the left. In Douglas's pouch a nodulated swelling could be felt, but not very clearly defined. *Per rectum*, at a distance of 4 inches from the anus and just within reach of the finger tip, a small opening with ragged edges could be felt in the front wall. This obviously led into the swelling mentioned. For some days the patient was much relieved, but after that time the discharge was less, and the cavity appeared to be only partly drained. Pyrexia reappeared, and the swelling could be more distinctly felt *per vaginam*. During Dr. Champneys's temporary absence the patient came under the care of Dr. Griffith. After consultation, and on grounds to be presently considered, it was determined to drain the cyst or abscess cavity by puncture through the vagina. This was accordingly done, and a glass tube inserted. The result was satisfactory, the discharge diminishing and the pyrexia disappearing. The patient left the hospital at the end of November, with no discharge from the rectum and scarcely any from the vagina. She was readmitted two months later. She had had no pain since leaving the hospital, the temperature being normal. She had passed no pus by the rectum, but had always had a slight discharge by the vagina. Her general health had greatly improved. On examination, an elastic swelling could be felt on the left side, reaching nearly to the navel. No opening could be felt by the rectum, but there was a hole admitting a probe in the posterior quarter of the vagina.

Assisted by Dr. Champneys I performed abdominal section. On the

abdomen being opened a thin-walled cyst presented itself, spreading up to the left side and behind the posterior layer of the broad ligament. The cyst was tapped, and two pints of clear fluid were let out. At the bottom of the cyst, after evacuation, another cyst with very thick walls could be felt firmly embedded in the pelvis, between the uterus and rectum. This second cyst was tapped through the broad ligament cyst which had already been opened. A considerable quantity of gas and from 3 to 4 ounces of greenish pus escaped. The pus being thoroughly washed out, both cysts were removed. The removal of the lower cyst was very difficult. After some separation, it was possible to drag it up from the deeper part of the pelvis. It was then found to be attached by firm adhesions to the vaginal wall, and to the posterior part of the uterus. The knife had to be freely used in separating it from the vagina, where the communication existed. After separation, the opening into the vagina would admit the finger tip. This was closed by fine sutures. The back part of the cyst was now found attached to the rectum, over an area of about 2 inches in diameter. This adhesion was carefully separated, till a portion somewhat less than an inch remained. This was obviously the site of the old communication, and its complete separation would have opened the rectum. The cyst was cut off, leaving this portion attached to the bowel. The surface was scraped with a Volckmann spoon, and touched over with the actual cautery. The abdomen was flushed and a glass drainage tube inserted. The patient recovered.

Case 2.—C. P., aged 32, was admitted into Martha Ward, under the care of Dr. Champneys, September, 1893. Had one child two months ago. For 14 days she was feverish and ill. She had some blood-stained discharge three weeks ago. Since that time she has had pain and difficulty in passing water, and the urine was discoloured. Two weeks ago something broke, and a quantity of matter escaped from the rectum, and has since continued. There is also considerable pus in the urine. Present condition : Is much emaciated and looks ill ; tongue dry and cracked. Extending nearly to the navel, 4½ inches broad, is a fixed elastic tender mass : on the left side of the upper part of the iliac fossa are some small, oval, freely movable masses.

Per Vaginam.—Cervix fixed ; behind and on the right side is a fixed indurated mass occupying the whole space on the left side. The part feels œdematous, but no certain elasticity can be felt. Bimanually the tumour has a more elastic feel. The patient was kept absolutely at rest in bed for a month. After a fortnight pus was no longer passed by the rectum, and that from the bladder decreased considerably ; the temperature, however, was variable, and always above normal. Operation. On opening the abdomen a cyst was found apparently in the broad ligament, but since everything was universally adherent its exact relations were difficult to make out. The cyst contained about a pint of greenish-white sweet pus ; it was adherent to the bladder and rectum. On separating the rectal adhesions there was a ragged looking spot, but no actual hole could be seen. The suspicious looking spot on the rectum was inverted and closed with four fine sutures. The bladder was distended by injecting water, but the site of the communication could not be found. The cyst was removed entire, and there was no pedicle. The opened broad ligament was partly stitched up, and a drainage tube inserted. A glass catheter was left in the urethra. Nothing occurred till the sixth day, the discharge through the drainage tube being slight and quite sweet. On

account of some irritation the wearing of the catheter was discontinued. 24 hours later urine to the extent of several ounces was passed by the drainage tube. The catheter was again kept in continuously for 10 days. No more urine ever passed by the wound. A fine india-rubber was substituted for the glass drainage tube. The patient convalesced without constitutional disturbance, and she was discharged from the hospital seven weeks after the operation. There was still a small sinus at the lower angle of the wound, but nothing came through it.

Case 3.—*Tubal Gestation communicating with the Rectum.*—C. E., aged 30, was admitted into St. Bartholomew's Hospital in July, 1893. She had menstruated on March 27, and continued to lose a blood-stained discharge till April 27, when she was seized during the night with cramp-like pain in the abdomen. The pain was very severe, and the abdomen tender on pressure. Three weeks later she had a similar attack, and on May 29 a third attack. On June 2 she was examined by Dr. Champneys, and the following note was made :—

"Healthy looking, not anæmic, breasts not enlarged, areolæ pigmented, abdomen flat, some resistance below navel with tenderness. The whole pelvic excavation, except the right posterior quarter, is occupied by a round, smooth, tender, elastic swelling. Bimanually the swelling is nowhere more than an inch and a half in thickness."

On July 13 she had considerable pain and tenderness. The temperature was 103°, and the swelling considerably increased in size. Assisted by my colleague, Mr. Bruce Clarke, I opened the abdomen and found a portion of omentum glued to the tumour, and this was separated with comparative ease. The tumour was bright red on the surface and very vascular Over its upper and outer surface there were 3 inches of Fallopian tube, thickened and firm, and 1 inch in diameter, looking at first like intestine. The sac was adherent to the rectum behind and at the outer side, and to the bladder and uterus to the right and in front. The adhesions were easily separated with the finger, and there was considerable hæmorrhage. The chief blood-vessels appeared to enter the cyst just below the fimbriated end of the tube, which was adherent to the broad ligament. The finger could be passed round the cyst on the left side, so that the thickened tube and what appeared to be a portion of the broad ligament formed a kind of pedicle 2 inches broad and ¾ inch thick. This was transfixed, tied, and divided, when the hæmorrhage to a great extent ceased. After division of the pedicle the finger tips were quickly passed round the whole of the cyst, which came away almost entire, leaving only a portion of old, firmly adherent clot at the bottom of Douglas's pouch. The cyst, on removal, was the size of a large fist. A fœtus, 5 inches long and 1½ ounces in weight was found lying in Douglas's pouch, probably extruded from the cyst in process of extraction. After removing the cyst the boundaries of the cavity were very clearly seen. Behind was the rectum, on the inner side the uterus, and it seemed clear that the cyst was intraperitoneal, namely, actually bounded by the structures mentioned, and that the lid of the cavity was formed by the omentum.

At this period of the operation a small speck of fæcal matter was discovered in one of the sponges. Upon investigation, a small circular opening, which would admit a large probe, was found in the rectum low down in Douglas's pouch. The tissue of the rectum in this neighbourhood was converted into a soft yellow-looking material, in the centre of which was the opening mentioned. The tissue was very friable, but two stitches

were eventually passed across the opening, and the edges inverted and approximated. The cavity was well flushed out, and a drainage tube inserted, reaching nearly to the bottom of the cavity. After the operation the patient was much collapsed; there was troublesome vomiting, and much abdominal pain and tenderness for some days, and her life was in considerable danger. The fluid, which was drawn out through the tube at frequent intervals, was at first watery and blood-stained. After a while it became purulent; it was never much in quantity, but from time to time had a distinct fæcal odour, bubbles of gas coming through. After three weeks the discharge again became sweet, and a fine india-rubber tube was substituted. She left the hospital eight weeks after the operation, and there was still a small sinus, but nothing came through it but a drop or two of opaque serum in the 24 hours.

Case 4.—Patient, a lady, aged 30, married, and with no children, was sent to me by Dr. MacVicker, of Almondsbury, with the following story. Eighteen months ago she had had an attack of what was supposed to be peritonitis. On recovering from this she felt pain in the lower part of the abdomen from time to time. At this period she consulted an eminent specialist, who informed her she had a tumour the size of an apple low down in the right side of the pelvis, and an exploratory operation was recommended. This advice was disregarded. During the last six months there had been only occasionally slight pelvic pain, but the evening temperature has been persistently raised, often as high as 104°, with profuse night sweats and great loss of flesh. Two months ago she had a sudden discharge of a large quantity of extremely fœtid pus by the rectum, and up to the present time this has been continued to a slight extent; some days she would be free from discharge, on others there would be half an ounce of pus.

On examining the abdomen no tumour could be detected. By the vagina an elastic swelling could be felt, low down behind the uterus, chiefly on the left side. The same swelling could be felt in the rectum, but the finger could detect no communicating opening. After consultation with Dr. Champneys, an operation was decided upon. On opening the abdomen, the small intestine and omentum were found matted together over the pelvic opening. After separating these, the apex of the swelling was reached. The tumour was in the broad ligament, which was expanded nearly horizontally over it. It was bounded above by the Fallopian tube, in front by the uterus, and on the outer side by the rectum. The expanded broad ligament was opened by a 3-inch incision. The tumour was situated so deeply and the parts were so rigid, that the separation had to be done almost entirely by feel. At the commencement this was very difficult, but when the fingers once got in to the right layer, the greater portion of it was shelled out with comparative ease. The tumour, however, was very rotten, and a portion which had extended behind the rectum, the size of a small egg, broke away. This portion gave great trouble, but eventually was removed. An opening which would just admit the finger tip could be distinctly felt behind the rectum, where it was uncovered by the peritoneum. It was impossible to see the opening, but a careful endeavour was made to close it by sutures with a cleft palate needle. The hole was closed in a sort of fashion, but precision and neatness were impracticable. A glass drainage tube was passed into the bottom of the cavity. The incision in the broad ligament was then accurately closed by fine sutures, with the exception of the place through

which the drainage tube passed; this, however, fitted quite tightly. Owing to the depth it did not seem practicable to draw the open layers of the broad ligament to the parietal peritoneum and skin. The operation was prolonged, and the patient suffered much from shock. For three days she held her own, and nothing came through the drainage tube except a small amount of blood-stained serum. On the fourth day some fluid fæculent matter was drawn from the tube. By 24 hours the quantity had considerably increased, and it became extremely difficult to keep the patient clean, the discharge being very fluid and fœtid. The repeated dressings seemed to exhaust the patient, and she gradually sank, and died on the seventh day after the operation. No *post-mortem* examination was obtained, so the question of leakage by the side of the tube and peritonitis was not ascertained.

Cases in which an opening has been accidentally made during the course of a complicated dissection are not here referred to, but only such as have existed by suppuration and softening prior to the operation, or where the discharge of pus from the bowel showed sufficiently clearly the nature of the case. In considering these cases two questions seem to arise—first, as to the propriety of abdominal section whilst there is still an open communication between the cyst and the rectum; and, secondly, if an operation is performed, as to the best means of dealing with the opening. In considering the propriety of abdominal section, the diagnosis becomes an important factor. In a considerable number of instances the previous history and a careful examination will make the nature of the pelvic swelling, which is discharging into the rectum, nearly certain; but occasionally there must arise an uncertainty in the diagnosis as to whether the pus proceeds from a simple pelvic abscess, or whether it is due to a suppurating ovarian tumour.

The first case recorded came under this category, and the treatment adopted was partly on the hypothesis that a simple pelvic abscess had to be dealt with. If the case is known to be a suppurating cyst, the danger of ovariotomy is doubtless increased, for after the tumour has been removed there remains an open communication between the intestine and the abdominal cavity, while its exact situation and the possibility of accurate closure cannot generally be ascertained until the operation has been completed. In Case 1 the facts were carefully considered by Dr. Griffith and myself in consultation. From the hectic symptoms, and the manner in which the patient was going down hill, it was obvious that something had to be done to drain more effectually the suppurating cavity. Three courses were open—to enlarge the opening

in the rectum and insert a drainage tube, to drain by the vagina, or to perform abdominal section with a view either to suprapubic drainage if a simple abscess had been found, or removal of the tumour if it should prove a suppurating ovary or tube. The first course was abandoned on the grounds not only of the extreme mechanical difficulty of keeping any tube inserted through the rectum in position, but also from the uncertainty of diagnosis, for if the swelling should prove to be a cyst ultimately requiring removal, it was of great importance if possible to get the rectal opening closed. Of the two remaining alternatives, drainage by the vagina was selected for the following reasons:—(1.) That the swelling could be felt projecting prominently into the vagina, whereas, being so deeply situated, it could not be felt above the pubes. (2.) That if the swelling should prove to be a suppurating cyst, it would be a great advantage to allow time for the recto-cystic fistula to spontaneously close, which we thought might be accomplished by temporary drainage. This hypothesis fortunately proved correct, for no sooner was the vaginal drainage established than the pus ceased to be discharged by the rectum, and when abdominal section was performed some weeks later the opening was found completely closed. The risk to the patient's life when the operation was performed was doubtless considerably less than if the rectal opening had still existed, for it was so low down that its effectual closure would have been extremely doubtful.

It is open to discussion whether in a similar case temporary drainage might not be better and more safely established by abdominal section. The propriety of such a procedure would probably be determined by the situation of the swelling. In our case it would have been very difficult to have got at the cavity from above, and if it had proved to have been an abscess, it would have been nearly impracticable to have fixed the edges of the opening to the parietal peritoneum, and anything short of this would have been highly dangerous, from the nature of the pus. On the other hand the abscess was almost pointing into the vagina. If the tumour had been situated high up in the pelvis, primary abdominal section with a view to removal or drainage would probably have been the right course.

The remaining cases recorded were simpler in their nature, inasmuch as the diagnosis was clear. There was no doubt that the tumours were suppurating cysts and not simple abscesses, and

from the fact that no opening could be felt within 4 inches of the anus, there seemed a fair chance of the fistulæ being sufficiently high for effectual closure after removal of the tumour. In two of the cases the openings were found in an accessible position and accurately closed by suture; but unfortunately in Case 4 the position of the hole right behind the rectum made its accurate closure impracticable.

As regards the details of the procedure in the circumstances of this case, in which there was no guarantee that the opening into the rectum was effectually closed by suture, there may be some difference of opinion. The tumour, owing to the way in which it had extended beneath the broad ligament was practically extra-peritoneal, and had it been possible the edges of the opening in the broad ligament through which it had been shelled out should have been raised and stitched to the lower angle of the abdominal incision, and drained. The only other feasible plan other than that which was adopted would have been to have entirely closed the opening in the broad ligament *in situ*, trusting that the cavity would have drained through the hole in the rectum, and eventually have closed up.

After carefully considering the facts in the case recorded, should I have the misfortune again to meet with a similar condition, I would, in the event of its being impracticable to raise the edges of the open broad ligament to the lower angle of the abdominal wound, prefer completely to close the broad ligament *in situ*, and trust to rectal drainage rather than run the risk of suprapubic drainage through the peritoneum.

Mr. Goodsall (the Vice-President, in the Chair) said that although he had seen a large number of cases of rectal abscess, he had never met with one similar to those related by the author. In such a case he would feel disposed to perform inguinal colotomy, and when the fistulous opening into the rectum had closed, he would proceed to close the colotomy wound. He pointed out that this procedure would have the effect of diverting from the pelvis the secretion most likely to prevent the operation from being successful. It was comparatively easy to keep the bladder empty, but it was much more difficult to do so with the rectum. He suggested that in the author's fourth case there would have been a better chance of saving the patient's life had inguinal colotomy been performed.

Dr. Cullingworth said Mr. Cripps's cases formed a series of much interest and importance. The treatment of cases of pelvic suppuration, complicated by rectal and other fistulæ, had a peculiar interest for him at the present moment, as the subject had recently been much in his thoughts, and had formed one of the topics in an address he had delivered at Birmingham in November last. In that address (which was published in full in the

'Birmingham Medical Review,' and in the 'Clinical Journal') he had pointed out that collections of matter in the pelvis bursting into neighbouring organs, were seldom or never abscesses in the pelvic connective tissue, as was commonly supposed, *simple* abscesses, as Mr. Cripps had called them, but were almost invariably either suppurating ovarian cysts, like the cases read that evening, or suppurating Fallopian tubes, or intraperitoneal abscesses, caused by an outpouring of pus from diseased Fallopian tubes. On this account he believed the proper practice, when the fistulæ became chronic, was to deal with them from above, namely, by abdominal section. In his address on Surgery, before the meeting of the British Medical Association at Leeds, in 1889, Mr. Pridgin Teale had narrated two cases of pelvic abscess with sinuses communicating with the rectum, in which the abdomen had been opened, the abscesses emptied and washed out, the edges of the walls of the abscess stitched to the abdominal wound, a drainage tube inserted, and the patients cured. The narration of these cases had impressed him (Dr. Cullingworth) very much, and he proceeded forthwith to adopt similar treatment in the case he happened to have under his care at the time. The result was admirable. But in the first place, the stitching of the edges of the aperture to the edges of the abdominal incision was a very difficult proceeding, owing to the depth of the abscess in the pelvis, and, secondly, he remained in ignorance as to the precise seat of the suppuration, and therefore also as to the cause. It appeared to him, in thinking the matter over, that it would be still better treatment if one could remove the whole of the disease instead of being content with emptying and draining the abscess, and that if the fistulæ, in the cases of Mr. Teale and Mr. Mayo Robson, had closed spontaneously from the time the abscess was emptied, there was good ground for hoping that they would give equally little trouble if the *walls* of the abscess were removed as well as its contents. Such radical treatment would be a natural expansion of, or evolution from, the treatment advocated by Mr. Teale. Accordingly he had adopted the method of total eradication of the suppurating cyst in the next case that came under his observation, and every case of the kind that he had had since. In his Birmingham address he had, from amongst the number he had dealt with, a typical example of each of four different varieties, viz., one of rectal fistula, one of vaginal fistula, one of fistula communicating with the cervical canal of the uterus, and one of fistula communicating with the bladder. All the cases he had hitherto done had been successful. In no case had he attempted to close the fistula by suture, and yet in none was there evidence of anything having, after the operation, passed through the fistulous opening, either from within outwards, or from without inwards. These operations were undoubtedly very difficult, but they had the great advantage over puncture or incision from below that the operator was not groping in the dark. He was able, by sight or touch, or both, to make himself master of the situation, and plan his measures accordingly. The author had spoken of the establishment of a communication with the abscess cavity through the vaginal roof in one of his cases as having been followed by a satisfactory result. He would suggest that it would be more correct to say a *temporarily* satisfactory result, inasmuch as the abscess refilled, and required to be dealt with subsequently in a more efficient manner. He would further suggest to the author the desirability of introducing the word "suppurating" into the title of his paper, so as to facilitate reference on the part of future workers. He should like to hear some further descriptive details of the

parts removed in the first of the four cases related. It had not been made clear whether both cysts were ovarian, or whether the lower one was a pyo-salpinx, and the upper, non-suppurating, one ovarian. It was very difficult in some cases to distinguish between a suppurating cyst formed by the sudden expansion of the outer end of an occluded and suppurating Fallopian tube, and a true suppurating cyst of the ovary.

Dr. Routh declined to admit that to operate on these cases from below was bad practice. On the contrary, he had had several cases of the kind, and in all except one he had adopted this plan with marked success. The puncture should be carried out on certain lines. If they had a tumour which was easily get-atable by the finger, which could evidently be punctured from the vagina or the rectum, why should that course not be adopted? They relieved the patient of all urgent symptoms, and very often cases went on to complete recovery. But he always used an aspirator, and when the fluid withdrawn by it was offensive, he forthwith washed out with the same instrument the cavity with a strong solution of iodine, and if necessary the process was repeated daily until the discharge was sweet again. The difficulty experienced in keeping in a drainage tube only applied to the glass tube. If a catheter provided with the usual contrivance for keeping it in were used, no such difficulty would be complained of. He did not think they were justified in exposing the patient to the risks inseparable from the abdominal operation when so comparatively simple a procedure would suffice in many cases to effect a cure. He did not approve of leaving the fistulous openings to heal of themselves. If Nature had made the opening, he at once made use of it to daily wash out the cavity. He referred to a case of pyo-salpinx with a very thin wall, in which he performed abdominal section instead of puncturing. When in the course of the operation he saw the thinness of the cyst, he felt convinced that it would rupture, and so it did, discharging a very large quantity of extremely fœtid pus. Although they at once irrigated the abdomen, the patient died. Had he attacked such a cyst with the aspirating needle, and washed it out with iodine, the patient's life might have been spared. He had long since refused to open the abdomen in cases in which the abscess cavity could be felt through the vagina or the rectum. But there was at present such a "furor secandi," that some surgeons preferred to perform abdominal section.

Mr. Harrison Cripps, in reply, said he only wished to place on record his four cases. Had he purposed dipping into the literature of the subject, he would certainly not have omitted to refer to the very valuable paper by Dr. Cullingworth on this subject. As to the nature of the cysts in his first case, he pointed out that the patient, when first seen, had one small cyst deep down in the pelvis—probably the second cyst, which he subsequently removed. That was most likely the ovary itself. The second cyst developed very rapidly, and appeared to be an entirely independent broad ligament cyst. He pointed out that it was very difficult to lay down any arbitrary rule as to the procedure to be adopted, for no two cases were alike. He had departed from the usual practice by an opening from above, because the partition separating the suppurating cavity from the vagina seemed so thin. He was not sure whether the abscess was ovarian or simple, and he thought that if he drained it in this situation it would afford a chance for the rectal opening to close, which it did. He pointed out that in such a case as his last one, puncture would have been utterly fruitless. The cyst had walls 2 inches thick, and the cavity containing pus was not larger than a walnut, so that the chances of a trocar

striking the cavity were small indeed. He would be very sorry to meet with any more of these cases, for they were most trying to deal with. His fear in respect to the rectal opening was not that it might not close of itself, but that while unclosed fæcal matter might escape into the peritoneal cavity, which would have been a far more serious accident.

February 19th, 1894.

ON THE ADMINISTRATION OF ANÆSTHETICS CLINICALLY CONSIDERED.

By Joseph White, F.R.C.S. Ed., D.C.L.

About forty years ago I laid before the Nottingham Medico-Chirurgical Society an analysis of several hundred cases of chloroform administration, and shortly afterwards I read at the Leicester meeting of the Midland branch of the British Medical Association a paper "On the Action of Chloroform," which was published in the 'British Medical Journal,' in June, 1857. In those two papers I endeavoured to give, as far as I then knew, a short exposition of the physiological action of chloroform and other anæsthetics. Some of the views which were then advanced a wider and longer experience has led me to modify, whilst in others a longer observation has but enabled me to confirm them.

I did not keep a permanent record of my earlier cases, but up to the present date the number of cases of which I have kept very brief but accurate notes amount to 7,055, viz.:—

Chloroform	4,049
Ether....	798
Nitrous oxide	691
Methylene bichloride	79
Amylene	5
A.C.E. mixture (which I have almost entirely used for many years)	1,433

I have therefore thought that after this lengthened period of time it might be of interest if I were to submit for your consideration some of the conclusions which more extended opportunities of observation have enabled me to form.

It is now so many years since the introduction of anæsthetics in surgical practice that I am afraid but few of us can remember the intense interest with which they were received, and if time had permitted I might have glanced for a few moments (I think profitably even now) at that epoch in the history of surgery as it fell under my own observation during the years of 1847 and 1848; for it is curious to look back to the days of the first employment of ether, and to call to mind the varied and contradictory effects which were attributed to it even by the leaders of the profession.

All kinds of misadventures, which we now know to have been entirely foreign to its effect, were alleged to have been due to its employment, and deaths manifestly due to other causes, and following operations after intervals of many days, were first suspected and then believed to have been due to its use.

I was just about leaving Edinburgh in the early part of 1847 when Simpson made his first experiments with anæsthetics which led to his introduction of the use of chloroform.

On the 19th of January (just a month after the first use of ether as an anæsthetic in England) Dr. Simpson administered it in a case of labour, and found that it was capable of relieving the uterine pains without interfering with the process of parturition. He emplcyed it largely with almost uniform success, and in the medical periodicals of the time he strongly advocated its use. He was, however, dissatisfied with the objectionable smell and exciting effects of ether, and he sought for an anæsthetic which, if possible, should be more easily administered; and after various trials he found it in the then little known substance chloroform.

On the 10th of November (1847) Dr. Simpson brought before the Medico-Chirurgical Society of Edinburgh the results of his experiments (those experiments which were so graphically described by his daughter in the 'Century Magazine' of last month), and he claimed for chloroform the following advantages over ether:—

1. A small quantity produced a more marked effect.
2. The narcotic effects were more rapidly induced, were more complete, and lasted for a longer period.
3. The inhalation of the vapour was more agreeable and attended with less irritation of the pulmonary organs, and required no special apparatus.

4. It was, moreover, more portable, cheaper in the long run, and *believed* to be safer than ether.

Ether was therefore rapidly supplanted by the new anæsthetic. In Edinburgh its use was at once very generally adopted, and Syme and Miller successfully performed operations under its influence within a few days of the reading of Simpson's paper. Its first employment in London was by Mr. Aston Key at Guy's on the 23rd of November (within a fortnight of Simpson's announcement), and a few days after that I saw Liston (who had been so dissatisfied with the excitement and struggling attending the use of ether as to give it up) use it with success in an amputation of the thigh. This was one of Liston's last operations, for he died of aneurism on the 7th of the following month.

The advantages claimed for chloroform by Simpson were generally admitted, *except as regarded its supposed safety.*

Several cases presenting dangerous symptoms were soon reported, and on the 28th of January, 1848, the first case of death clearly attributable to chloroform occurred in the neighbourhood of Newcastle, and which, at the time, caused the greatest interest and excitement.

This was the case of Hannah Greener, a healthy girl of 15, to whom chloroform was administered for the removal of a toenail. About a teaspoonful of chloroform was given on a folded napkin, and the patient *was seated in a chair by the fireside.* The death was sudden, and the time that elapsed from the first inhalation to death was under three minutes.

Post-mortem examination revealed no disease except slight congestion of lungs and an empty condition of the left cavities of the heart.

In the next month, on the 23rd of February, a second death under similar circumstances was reported from Cincinnati, in America. This was the case of a healthy woman of 35, who went to a dentist's to have two or three stumps of teeth removed—had about ʒij of chloroform administered whilst seated in a dentist's chair, and in two minutes was dead.

Here, again, on *post-mortem* examination, all organs were found healthy, except a slightly congested condition of lungs, with a flaccid state of heart and an empty condition of all its cavities.

Various explanations were attempted to be given of the cause of

these deaths, and blame was attributed to the mode of administration and to the want of experience in the administrator.

On the 30th of June, however, a case occurred which at once aroused the apprehension of the profession to the great danger attending the use of chloroform even in practised hands.

One of the earliest and most extensive administrators of ether and chloroform (I think he was the first who gave ether successfully in this country) was Mr. Robinson, a dentist in Gower Street, who had written largely upon their use, and who it was stated had himself administered anæsthetics in dental and other operations between 3,000 and 4,000 times.

On the 30th of June (1848), Mr. Walter Badger, of Rotherham (a young solicitor of 22, and son of one of the coroners for Yorkshire), called upon Mr. Robinson to have two or three stumps extracted, and wished to have chloroform. He was seated in the dentist's chair and had about $1\frac{1}{2}$ drams of chloroform given to him, and in less than one minute he was dead.

At the *post-mortem* the lungs were found perfectly healthy, but the heart was fatty, especially at its apex, and the liver was considerably enlarged.

In all these early cases of death under chloroform it was to be noted (and for *this* reason I have been anxions to refer to them here) that death took place without any warning, very soon after the commencement of inhalation, and when the patient was in a *sitting* posture; and that the operations were of a trifling kind.

During the next few months other cases of death under chloroform were from time to time reported, two more in England, two in France, one more in the United States, and one in India, occurred during the first year of its use. All as sudden, and all unexpected; all for trifling operations, and all in apparently healthy people.

Post-mortem examinations revealed no morbid changes other than congested lungs (sometimes very slight) and a flaccid and partially empty condition of heart.

Great efforts were therefore naturally made to investigate both experimentally and clinically the physiological action of chloroform; and one of the most assiduous investigators was the late Dr. Snow, whilst important experiments on its action were made at the same time by several others, among the chief of whom were Dr. Sibson, then of the Nottingham General Hospital, Dr. Perry, of Birmingham, and Dr. Glover, of the Newcastle Medical School.

These experiments, however, I will not refer to now. My main object this evening is to deduce from a fairly large clinical experience and a considerable number of carefully recorded observations, some practical points in our use of anæsthetics.

The effects of chloroform, and of most other anæsthetics also, as observed in ordinary cases of inhalation, may, I think, be practically divided into four stages :—

1. The period of continued consciousness.
2. „ semi-consciousness.
3. „ sleep.
4. „ coma and threatened death.

In the first period, according to the above division, a patient will generally retain perfect consciousness of all that is going on around him for some little time after administration has commenced. He will tell you his sensations, and will frequently inform you that the anæsthetic is failing in its effect, for he feels no difference. In this stage the pulse is generally quickened and sometimes feeble, the face flushed, the respiration hurried for a few moments, then slow, and sometimes voluntarily suspended; but the patient still perfectly understands all that is said to him.

Even this preliminary stage is not free from danger, and in most of the *early* cases of death from chloroform it occurred in this stage.

In the case of Mr. Badger, he died in less than one minute from the commencement of inhalation, and during a state in which he had been perfectly conscious up to a few seconds before his death. He remarked to Mr. Robinson, "It is very pleasant," his hand and head dropped and he was dead.

Such was the case, also, in others of the deaths. In Dr. Snow's table of 50 examples of the earlier deaths under chloroform, nine of the patients died within the minute after the commencement of inhalation, and four of these within a few seconds.

In this stage, too, the element of *fear* may become a very important factor. A patient in face of an operation knows, and not unfrequently over estimates, his danger; and he may (I will not say frequently, for it is really surprising how seldom such occurs even in the most nervous people) approach the operation in an almost fainting condition from sheer dread. A fainting heart, fainting already from sustained nervous tension, faints outright in

the preliminary stage of narcotism, and a very small quantity of chloroform may under such condition prove fatal. Several deaths of this kind have been reported; and though I have never seen a death occur under these or any other circumstances, I have seen *several* cases in which most alarming syncope has occurred, purely the result of fear; and hence the great importance of promoting to the utmost of our power the confidence and courage of a patient in the prospect of an operation.

With the commencement of the *second* period consciousness becomes clouded; a dreamy state occurs in which a patient may become talkative, incoherent, excited, and will frequently struggle, sometimes violently; he will raise himself upon the bed in spite of every effort to restrain him, and his face will be flushed or livid from his exertion; he will hold his breath for several seconds, and then fall back upon his bed prostrate and almost pulseless. It is not surprising therefore to be told that in *such* condition danger and even death may supervene. A considerable number of the deaths recorded have been in this period of administration, and it was only a few months ago that such a death occurred in one of the hospitals in the south of England. This was a case of amputation of leg, in which ʒiij of methylene bichloride were used. In three minutes the patient struggled violently, and was cyanosed; in one minute later he suddenly ceased struggling, his face changed to a leaden hue, respiration and pulsation stopped simultaneously; he gave two deep gasps, and was dead.

Ether was injected subcutaneously, an interrupted current of galvanism was applied to the heart, artificial respiration was immediately commenced and maintained for half an hour, but all was useless. This was in an institution in which methylene was the ordinary anæsthetic, and where it was administered 300 or 400 times a year.

In this stage also, though generally a little later on, *sickness* will very frequently occur, almost *certainly* unless care has been taken to cause the patient to abstain from food for three or four hours previous to inhalation.

There are, I think, few symptoms that are more trying to the administrator than this sickness under chloroform. The great and sudden prostration, the rapid failure of pulse, the blanched countenance with the profuse clammy perspiration indicate a condition of syncope, which is always a very anxious one. This sick-

ness, moreover, generally comes on just as a patient is becoming unconscious, and just as an operation is about to be commenced. The sickness thoroughly rouses him to sensibility, though in a state of great collapse; and, after a brief interval of rallying, during which vomiting again and again occurs, inhalation has to be cautiously renewed, and, of course, under very unfavourable conditions.

At the *end* of this second period a remarkable set of symptoms occur. The patient gradually become tranquil, the breathing becomes regular, natural in depth and frequency, and the pulse generally firmer and of normal rate.

He is now unconscious of what is passing, but may be readily aroused, and the conjunctival reflex is still active. The eyelid if raised falls again, and the eyeball slowly rolls from side to side. The pupil (and this I look upon as a most important guide) which up to this time has generally somewhat dilated, now gently oscillates between dilatation and contraction, and then remains contracted almost to a point. If, when the pupil is thoroughly contracted, the eyelid now be raised it does *not* fall again, and the eyeball is perfectly motionless. The conjunctival reflex is *completely* abolished, and the patient passes into a condition of *perfect sleep*.

This oscillation and contraction of the pupil which accompanies the abolition of the conjunctival reflex I look upon as an almost unerring guide. I have not found it fail in 1 per cent. of my cases.

I have termed this third period "the period of sleep"; I believe it is a condition of *perfect* sleep; a condition analogous to that of *natural* sleep, except that so long as the action of the anæsthetic is maintained the patient cannot be awakened *suddenly*.

In this condition an operation, however painful, may be painlessly performed; and by assiduously and carefully watching the state of the respiration, of the pulse, and especially of the *pupil*, I believe that this condition, when once attained, may be prolonged almost indefinitely, and with very little danger.

Unfortunately, we know little of the true physiology of natural sleep, and notwithstanding the various theories which have been at different times advanced, we still know *very* little of its causes; but the researches of different observers during the last few years have taught us so much of its *objective* signs that I think we may,

in this way, fairly compare it with what we observe in the narcosis of anæsthesia.

In *natural* sleep, of course, the nervous system as a whole falls into a quiescent condition ; its functions are curtailed, and some of them abolished ; whilst those which persist are carried on in a modified manner and in a diminished degree.

The psychical centres in the convolutions of the brain, so active during waking moments, are, in sleep, at rest, and consciousness and volition are in abeyance.

In *natural* sleep, also, the motor and sensory centres partake of a like tranquillity. The sensory centres become incapable of perceiving slight or ordinary sensations, whilst their corresponding motor nerves respond in a slow and imperfect way ; and the great nervous centres in the medulla oblongata, which are mainly concerned with the carrying on of respiration and circulation are, so far as is compatible with life, asleep.

The spinal cord, too, is less active, and reflex movements can only be produced in response to more powerful excitation than when awake.

In short, the brain, the ganglia, the medulla, and the cord are gradually thrown into a state of repose, and the functions of life are carried on with the smallest possible expenditure of force.

As was long ago pointed out by Bichat, and confirmed by the investigations of recent writers, the onset of *natural sleep* is gradual and progressive, and this gradual progression is found to occur in a certain definite order.

First, the *motor* centres become affected, and the whole muscular system relaxed and at rest.

Then the *psychical* centres gradually fall under its influence ; the will ceases to control the intellectual faculties, and the powers of perception grow less and less.

And, lastly, the centres for the *special* senses (each in its turn) become progressively inactive, and fail to perceive sensations of an ordinary kind, whilst their special nerves transmit impressions more and more feebly.

Among the special senses we are *now* mainly concerned with those of *sight* and *touch*, for these are the senses whose objective symptoms are most manifest to us in the narcosis of anæsthesia.

As natural sleep comes on the sense of *vision* becomes clouded, and the eye becomes more and more insensible to light ; the

eyelids close; the eyeballs turn upwards and inwards in the orbits; the axes are slightly convergent as though in distant vision; and the pupils gradually contract, the extent of this contraction being in proportion to the depth of sleep; and in the early sleep of children it is frequently noticed that before complete contraction of the pupils takes place there is that same rolling to and fro of the eyeballs, and that same oscillation between dilatation and contraction, which I have mentioned as preceding the pupillary *contraction* in chloroform narcosis.

For many years I have taken the opportunity of examining the eyes of numbers of sleepers, and I have scarcely ever found this contracted state of pupil absent, except, of course, in cases of cerebral compression.

The sense of *touch* also becomes affected in the same gradual manner, whether in the case of *natural sleep* or of *sleep from anæsthesia*. Eulenberg found that in natural sleep first the muscular reflex is abolished; then the reflex from the skin; then that from the conjunctivæ; and, lastly, that from the nose; and such is also the order in the narcosis of chloroform.

In fact, whether we notice the *character* of the events or whether we notice the *order* in which those events occur, we are struck with the remarkable similarity, if not identity, of the phenomena which mark the progress of natural sleep, and of the sleep which characterises the third period of the effect of anæsthetics.

I have called the fourth period "The period of coma and of threatened death."

If, after obtaining the condition of sleep, we push the administration of an anæsthetic to a still greater degree we produce the following symptoms:—The pupil, from being fully contracted, gradually dilates until it is very widely so, the eyeball remaining fixed and utterly insensible to touch; the breathing becomes stertorous; the respirations become slow, often from six to eight per minute slower than when in the state of sleep; then shallow, irregular, and almost entirely diaphragmatic; the heart acts for a time laboriously, then more slowly and more and more feebly; the muscles become more and more relaxed; there is profuse cold perspiration; the sphincters lose their power; and death ensues: generally the respiration ceasing before the pulse, but occasionally the pulse and respiration apparently ceasing simultaneously.

In short, the state of sleep of the third stage passes into a state

of so-called coma, and death supervenes with symptoms similar to those we observe in cases of apoplexy.

This stage in the human subject of course rarely goes on to death, for the administration would not be likely to be prolonged to a fatal issue; but more than one case has been reported in which death has been clearly attributable to this degree of narcotism.

I have never carried the administration of chloroform far into this fourth stage, except for the reduction of dislocations or for the application of taxis in hernia; but I have even here (although on the active look out for them, and endeavouring to guard against them) met with cases showing *most alarming symptoms*, and requiring very prompt treatment for the recovery of the patient.

The course of symptoms, however, *even on to death*, was shown in a marked and unvarying manner in Sibson's experiments upon the lower animals.

One of the chief objects of the experiments of Sibson, Dr. Percy, and Dr. Glover, and later on of Snow and Richardson, was to determine, if possible, whether the deaths from anæsthetics were primarily attributable to interference with respiration or to failure of the heart's action, and, as a consequence, what should be the appropriate means to be adopted in case of accident.

They found that in cases of *rapid* death, *i.e.*, in cases where a *large* dose had been *suddenly* given to an animal, and death had followed very quickly after the commencement of administration, the action of the heart was invariably the first suddenly to fail; whereas in the *slow* and sustained administration of chloroform the respiration failed first, though at the same time the heart's action was depressed almost to syncope; and Sibson entertained the idea that as the heart is the first organ of the body to be fed with the blood charged with chloroform from the pulmonary veins, therefore it would be the first organ to succumb under the sudden influence of the anæsthetic, and would of necessity feel the influence before the respiratory muscles felt it.

At Sibson's suggestion in the early part of 1851 I made some experiments upon the difference in the amount of chloroform in the blood after rapid and gradual administration, and found that in an animal killed by the *sudden action of an overdose* the blood of the carotids and femorals, as estimated by Duroy's process for the detection of chloroform, contained little more than two-thirds the

amount of that obtained from an animal to which chloroform had been given *slowly* to the extent of producing *safe* anæsthesia. Death was not the result of the *amount* in the circulation, but of the *sudden* action of a lethal dose.

For more than 30 years the same question has been attempted to be solved, both by individual workers and by the combined efforts of authorised committees. I will very briefly refer to the results obtained by one or two of them.

In 1863, the Royal Medical and Chirurgical Society of London appointed a Committee to investigate the whole subject, and their Report is contained in the 'Transactions of the Society' for 1864.

They found that if chloroform alone were given slowly, and in moderate quantity, its first effect, as tested by the hæmodynamometer, was to raise the blood pressure, to temporarily increase the power of the heart, but that this was speedily followed by depression, and that though respiration generally failed before the pulse ceased, the force of circulation was so reduced as to be scarcely perceptible.

If *ether* were used, however, the blood pressure was maintained until after the failure of respiration; and they believed that it was by the circulation of non-oxygenated blood, owing to that respiratory failure, that the heart ceased to act.

They, therefore, recommended the administration of ether, or mixtures of ether and chloroform, instead of chloroform alone; and the immediate resort to artificial respiration in case of threatened danger.

At the Manchester meeting of the British Medical Association in 1877, a Committee was appointed to investigate the action of anæsthetics generally, and this Committee, consisting of Professor McKendrick, Dr. Joseph Coats, and Dr. David Newman (all of Glasgow), was afterwards known as the "Glasgow Committee." This Committee continued their work for about three years, and their Report was published in the 2nd vol. of the 'British Medical Journal' for 1880.

Their object was to investigate the special causes of danger in chloroform inhalation, and to try whether some anæsthetic agent could not be found which would avoid those dangers.

This Committee carried out an extensive series of observations to this end, with a considerable number of anæsthetics of various kinds; and in their experiments they employed a very complete

recording apparatus, which registered automatically and simultaneously the heart's impulse and the respiratory movements, and thus gave most trustworthy tracings of both.

At the outset of their inquiry, the usual vexed question of the effects of chloroform on the respiration and on the heart presented itself; and it soon became apparent that chloroform administered to dogs and rabbits had a disastrous effect upon the respiratory centres. They found, as Sibson had found, and as subsequent experimenters had found, that it was easy to kill one of these animals by pushing the chloroform until the respiration was paralysed; but they also found that even when failure of respiration was more directly the cause of death, the heart was to a considerable extent simultaneously affected; and that there were cases in which the heart appeared to fail as soon as, if not before, the failure of the breathing.

They found, moreover, that though chloroform had invariably so serious an effect upon the heart's action, *ether had not;* indeed, that ether might be given for an almost indefinite period without interfering with the heart.

They also found that though chloroform *always* produced a great diminution of blood pressure, it had *at times* a most unexpected and apparently capricious effect upon the heart's action, the pressure being reduced with sudden rapidity almost to *nil;* whilst the pulsations were greatly retarded or even stopped.* They (the Committee) believed that the occurrence of these sudden and unlooked for effects upon the heart were a source of most serious danger to life; and they felt this danger all the more, as in two instances it occurred more than a minute after chloroform had ceased to be administered.

The Glasgow Committee, therefore, came to the rational conclusion that *practically* it is not only necessary to closely watch the effect of the anæsthetic upon the respiration, but equally necessary to have regard to its effect upon the pulse; and they drew the inference that we must not only take into account the danger of sudden stoppage of the *respiration*, but, owing to the tendency of chloroform to reduce the blood pressure *suddenly*, it was also necessary for the administrator to be on the look out for sudden

* This sudden fall of blood pressure would seem to correspond to the sudden diminution of diameter of radial artery under chloroform recently pointed out by Dr. Oliver, of Harrogate.

stoppage of the *heart*—not only during the time the anæsthetic was being given, but for some time after the patient had recovered from its more evident effects.

The Committee, moreover, came to the conclusion, as the result of their experiments, that artificial respiration was the most effective means of restoring animals in danger of dying from the effects of chloroform; and as in one case its prolonged use produced recovery, even when the heart had ceased beating for a considerable time, they urged that in cases of apparent death, artificial respiration should be continued, even though all evidence of cardiac action had ceased.

I have mentioned the work and conclusions of the Glasgow Committee somewhat in detail, as they were the conclusions at which this Committee arrived, which were so strongly combated by the recent commissions at Hyderabad, to which time forbids me to do more than very briefly to remind you of the conclusions at which that Committee arrived. They found:—

1. That the administration of chloroform is free from all risk provided that the breathing be perfectly regular throughout, and that inhalation be stopped as soon as the subject is fully under its influence.
2. That chloroform *never* causes death by sudden stoppage of the heart.
3. That death from chloroform is always the result of an overdose.
4. That the danger of overdosing is enormously increased by holding the breath, by struggling, or by anything which causes gasping inspirations; and
5. That the inhibitory action of the vagus nerve, which is called into play in threatened or actual poisoning with chloroform, is an important safeguard against a fatal result.

Had time permitted I should have been glad to have said a few words on each of these points, but though in the main agreeing with most of the deductions arrived at by the Hyderabad Commission, there is one point on which I must very strongly differ from them.

The Commission maintain that it is not only *un*necessary to have regard to the condition of the pulse during the administration of an anæsthetic, but that it is *positively wrong to do so;* as we

then divert our attention from the only point of importance—the watching of the respiration.

I also cannot attach too much weight to *the most zealous and constant watching of the breathing;* but I am quite sure that a great, and I believe an *equally* important, warning of approaching danger may be gathered from the rapid enfeeblement and flickering of pulse which (as far as my own experience has gone) has almost invariably ushered in the crisis of danger.

There need be no difficulty in watching the circulation at the same time as we watch the respiration during inhalation; and I feel that it would be most dangerous teaching to utterly disregard (as the Commission desire to disregard) the important warning frequently given by the pulse.

A few months ago I was asked to give chloroform to a little boy of about 7 years of age, upon whom the family surgeon proposed to perform a simple operation.

He was a nervous child of very timid parents, and to prevent his being alarmed by the presence of a stranger I found that it had been arranged that the administration should be commenced by his usual attendant, and that as soon as he was partially insensible I should be admitted to his room.

In less than two minutes I was summoned to him, and found him perfectly unconscious, with stertorous breathing, fixed eye, and dilated pupils. I had just time to place my finger on the pulse, which was slow and feeble, when it suddenly stopped, and after giving one deep gasp, the breathing ceased also.

The face, which had been slightly flushed, turned deadly pale, and the lips and tongue were colourless and motionless. The eyes were fixed, and the eyelids widely open and insensible to touch; and the child had that peculiar appearance with which one is so familiar in death—and for some minutes I quite thought that he was dead.

Artificial respiration was instantly commenced, and strong ammonia applied to the nostrils. For several minutes there was no response either by respiration or pulsation, and although (as in similar circumstances at Hyderabad) a needle thrust into the heart *might* have shown some movement, the stethoscope or the finger could not detect the *slightest* cardiac beat. In about four or five minutes we thought we could perceive most indistinct pulsation at the wrist, and this gradually increased and respiration slowly

returned; but I never saw a case in which I had greater reason for despair.

Was this sudden syncope due to an overdose, or rather to too rapid a dose, as would be claimed by the Hyderabad Commission; or to the unlooked-for and capricious effect of chloroform, as would be so interpreted by the Glasgow Committee?

The boy was perfectly healthy and strong, and had no trace of cardiac affection; and he was of an age in which chloroform is generally taken with the greatest safety. I believe that the sole cause of danger was, that in order to save the feelings of the parents, the anæsthetic had been given too rapidly and in a cumulative dose.

I will, in conclusion, summarise, in the form of a few short hints, some of the points which I think may perhaps help to guide us in our mode of administration.

As I have already suggested, I think we should, as a preliminary step, endeavour by every possible means to encourage a patient in the prospect of an operation to remove any undue fear, and to render him tranquil at the time of administration.

For three or four hours before the use of an anæsthetic no food should be taken, unless it be a very small amount of alcoholic stimulant or a few spoonfuls of liquid nourishment, or vomiting, with all its consequences, is almost sure to take place.

The patient should always, if possible, be placed in a horizontal posture, all tight clothing should be carefully set free or removed, and the neck and chest of the patient relieved of the slightest pressure.

The *undivided* attention of the anæsthetist should be given to the patient during the *whole period of administration.*

The patient should be kept as quiet and cheerful as possible when inhalation is begun. There should be no noise about him, and he should never be spoken to or disturbed until sleep takes place.

Inhalation should be commenced very gradually, beginning with a free admixture of atmospheric air, and the proportion of anæsthetic vapour slowly increased.

If struggling occurs, we should admit more air or remove the inhaler; when struggling subsides, we should gradually resume the anæsthetic, and endeavour to maintain regular breathing until the period of sleep is reached.

We should carefully watch the state of pupil, which is generally that of moderate dilatation, until the conjunctiva begins to be insensible. Then the pupil oscillates between dilatation and contraction, and the eyeball slowly rolls in its orbit. The eyeball then becomes fixed; the conjunctival reflex becomes more and more feeble, and then disappears. The pupil will now be found to be fully contracted, and the condition of *sleep* is attained.

This condition of sleep can be kept up for a considerable time.

As soon as there is full contraction of the pupil, the inhaler should be removed, and gently re-applied if the pupillary contraction passes off, and the eye begins to move. This renewed movement of the eyeball and diminishing contraction of the pupil invariably usher in returning consciousness.

The movements of the pupil and of the eyeball, and the conjunctival insensibility, *pass off in an inverse order to that of their accession*, and afford the most accurate guide for any necessary renewal of the anæsthetic.

An operation should never be commenced until this condition of sleep is reached. The slightest disturbance of a patient, either by noise, or by a slight puncture, or by movement, will so rouse him as to render him dreamy and excited, and will generally produce a depressing action both on the respiration and the pulse.

If stertorous breathing should occur, with fixed eye and dilated pupil, inhalation should immediately be stopped.

We should never, if possible, attempt to rouse a patient suddenly from his sleep by slapping, &c. The free admission of air to the apartment, and to the face and chest of the patient, and, if necessary, gentle application of ammonia to the nostrils, are the best restoratives in ordinary cases of *excessive* anæsthesia.

And, lastly, we should *most carefully watch the state of respiration and pulse*, and the condition of the pupil and aspect of the countenance, during the whole period of inhalation, and if the respiration or pulse fail, we should have immediate recourse to artificial respiration, *free* admission of air, and application of ammonia to the nostrils; and, if, necessary, we should gently but regularly maintain artificial respiration for at least half an hour.

I may may just add that I believe there is, as stated by the Chloroform Committee of the Royal Medical and Chirurgical Society, a considerable advantage in the use of mixtures of ether and chloroform over that of chloroform alone.

I have for many years employed the A.C.E. mixture almost exclusively, and have given it in nearly 1,500 cases. It is certainly less depressing than chloroform, and apparently not more irritating to the pulmonary mucous membrane.

I have, so far, never seen any but the most favourable results from its use, and I cannot help feeling that it is decidely more free from danger than chloroform by itself.

Dr. Sansom observed that the subject of chloroform administration had in years gone by occupied a good deal of his attention. Although he could not, like the author, go back to the earliest days of the introduction of anæsthetics, he had previously to the year 1859 devoted much time and attention to it. Between 1859 and 1868 he had probably given chloroform more frequently than anyone, at any rate in this country. The outcome of his researches was a book, published in 1865, which embodied a consensus of the teaching of cases at that time. It had been a matter of surprise to him since to see the attitude of the profession towards chloroform. On reviewing the position which he had taken up at the time, he did not think he would be disposed to modify it in any way. From that time to this there had been a widely spread opinion that chloroform might be given in the most haphazard fashion without any dread of coroners' inquests. He himself had felt from the beginning that chloroform was a very dangerous drug, one which ought to be administered with the very greatest possible caution. The author had related to them instances, from the early history of its introduction, showing how easy it was for persons to die after the inhalation of a very small quantity—though this did not necessarily imply that the proportion in the atmosphere administered within a given time was small. Unfortunately, many of the most eminent men had followed the suggestion to give massive doses without taking any care to dilute the vapour. The doctrine that the heart did not fail in chloroform anæsthesia, he regretted to say, had been perniciously enforced by the Hyderabad Commission, which teaching he heartily and earnestly protested against. With every respect for the care with which they had carried out their observations, he considered that their results really only confirmed the experiments which had been carried out in his own time. The general conclusions arrived at were that nine out of ten animals succumbed from sudden overpowering of the respiration. Respiration, in fact, was the first to succumb, not invariably, but in a very large proportion of cases. It was, however, a most unwise and unjustifiable conclusion to infer therefrom that because animals so died that therefore man did likewise. Clinical observation showed clearly enough that in human beings syncope was the usual mode of death. Even if he conceded all that the Committee demanded, even if he admitted that the respiration was the first to fail, the practical conclusion was the same. Whether the heart-centre or the respiration-centre was the first to fail was, after all, only a *question de milieu*. As regarded the *post-mortem* examinations, the fatty degeneration of that organ, quoted as in many cases a fair explanation of the proneness to death, was an absolute chimera. It was not the heart-muscle that failed, but the nervous mechanism. There was a widespread idea that a heart which presented a patch or two of fatty degeneration was apt to fail in a moment. As a matter of fact, the amount of degeneration met with was not enough to

account for the failure. More pronounced degeneration would be found in many cases of death from any cause in the subject of anæmia, and he protested against the idea that fatty degeneration of the heart was a common cause of sudden death. In Vienna, out of 850 sudden deaths examined *post-mortem* in the department devoted to medical jurisprudence, in only about six could death be ascribed to fatty degeneration of the heart. Do we sufficiently realise the amount of chloroform passing into a patient's lungs when a couple of drams of chloroform are poured on a towel or handkerchief, and held before the mouth? He had tried experiments for the purpose of testing what the strength of the vapour would be under these circumstances, and he had ascertained that it might constitute 30 per cent. of the atmosphere. Clover, as the result of much observation, had declared 5 per cent. of chloroform vapour to be positively dangerous, and it was now conceded that 1 per cent. of the vapour was sufficient to produce and maintain anæsthesia. He was not pleading for the exclusive use of mechanical contrivances, but they ought certainly to do something to obtain the proper dilution of the vapour. Several kinds of apparatus had been devised in recent years by means of which it was possible for the anæsthetist to control the amount of vapour given. He agreed that the A.C.E. mixture was a very useful combination for anæsthetic purposes, though the different volatilising powers of the several constituents proved a drawback. He himself preferred a mixture of equal parts of absolute alcohol and chloroform. The alcohol did not act so much as a diluent of the chloroform vapour, but it rather retarded the vaporisation of the chloroform, thus diminishing the strength of the vapour administered. The ether was a *quantité négligeable*. They ought, consequently, either to employ an inhaler or to use a mixture of chloroform and alcohol. In this way only could they hope to reduce the danger of a sudden overdose.

Dr. Hewitt observed that, judging from the author's description of the stages of chloroform narcosis, he (the author) was in the habit of working with a degree of anæsthesia which was insufficient for the performance of many surgical operations. The author had spoken of a stage of sleep and of minutely contracted pupils as evidence of that condition of sleep. He (Dr. Hewitt) dissented from the view that this minutely contracted pupil during chloroform administration indicated a degree of anæsthesia sufficiently deep for operations on the more sensitive parts. For such operations the pupils ought only to be moderately contracted, certainly not to a pin's point, say to about 2 or 2·5 mm. This stage would be reached by giving a little more chloroform after the author's third stage had been secured. He considered the A.C.E. mixture very useful, especially in elderly people, in whom it gave rise to less disagreeable after effects than were observed after chloroform. The objection in respect of the difference in the vaporisation of the various constituents might be obviated by using only small and frequently renewed doses. Undoubtedly, if an ounce or so of the mixture were poured at once into the inhaler, this difference might influence the result. He agreed that it was preferable to give chloroform gradually, and not heedlessly or recklessly. The great thing was the administration of a continuous and well diluted vapour. He asked how it was that strong vigorous men were the worst subjects for chloroform anæsthesia. He suggested that possibly it was because having well developed respiratory muscles the muscular excitement incidental to the second stage of chloroform narcosis threw them into a spasm causing asphyxia. The condition of excitement was particularly well marked in

alcoholic and very muscular people, whereas in women and children the disturbance was proportionally less marked. This was a point which ought to be taken into consideration in choosing an anæsthetic. He did not agree that stertorous breathing was an undesirable sign. On the contrary, he held that a regular snoring stertor was a good indication, and should be maintained. Skilled chloroformists had shown that deep anæsthesia was really safer than light anæsthesia. He pointed out that the deglutition reflex was often as valuable a guide as the conjunctival reflex, and when present indicated insufficient anæsthesia. He agreed with the previous speaker's remarks in reference to the findings of the Hyderabad Commission. He thought, indeed, that they had attempted to lead the profession astray, and their work would ultimately find its level. The researches of Gaskell and Shore showed that the fall in arterial pressure under chloroform was due at least as much to weakening of the heart as to vaso-motor paralysis, a finding which was completely in accord with the results of clinical observation. MacWilliam, too, had shown that the cavities of the heart tended to become somewhat dilated under the influence of chloroform, and that, too, harmonised with what they observed clinically.

Dr. Silk thought that, far from being in a minority, Dr. Sansom would probably find himself in a considerable majority on this occasion. Dr. Silk thought that all anæsthetists were agreed that chloroform was a very powerful, possibly a terribly powerful, agent, and it might even be absolutely dangerous. Its safety depended a good deal more on the care with which it was administered than upon the drug itself. He thought that they were indebted to the reader of the paper for having dealt with the subject from the point of view of clinical teaching, rather than merely dwelling upon the respective advantages of the various anæsthetics. Alluding to the suggestion that the element of fear entered largely into the danger attending the first stage of anæsthesia, he thought that we ought not to over estimate this element. If it had entered at all largely into the cause of death, the fatalities in earlier times ought to have been far more frequent than they had actually been, and that now they ought virtually to have ceased. In his opinion, neither the Hyderabad Committee, nor the Scotch Commission, nor private physiologists had succeeded in satisfactorily explaining these sudden deaths during the first stage. Passing on to the second stage, he suggested that the excitement which marked the muscular system during this period might conceivably involve the heart, giving rise to what Professor MacWilliam had called "delirium cordis"; the condition, that is, in which the heart was prone to become suddenly dilated, both the heart, muscle, and the systemic muscles being, so to speak, in a state of "turmoil." Another point worth mentioning in connection with this stage was the frequency with which Dr. White appeared to have met with sickness. In Dr. Silk's own practice, sickness in this stage was quite exceptional. He went on the principle that the stage of excitement was one to be rendered as short as possible, consequently, instead of withdrawing the anæsthetic he pushed it, in order the sooner to pass this dangerous period. He suggested that when the patient began to swallow suspiciously, or to have borborygmi, it was time to push the anæsthetic. He urged this because he looked upon the preliminary stage of sickness as one of depression; they might not be able to get rid of the depression at this period, but by pushing the chloroform they might avert the further depression inseparable from the act of sickness, or which immediately followed it. His impression was that a

good many deaths had occurred immediately after the sickness owing, doubtless, to the depression produced. With regard to the third stage, he had not the same confidence in the indications afforded by the state of the pupil, as the author seemed to have. Dr. Silk held that, although practically the chloroform pupil was a small one, a distinctly contracted pupil, yet, as a matter of fact, the pupils oscillated a good deal during the first two stages, even in the same individual, and did not settle down until quite late in the third stage. In different individuals, too, this variation was even more marked. In children, for example, there might be a large pupil at a time when the child was far removed from dangerous narcosis; the pupils of muscular struggling patients, too, would sometimes dilate like those of an athlete after violent exertion. He agreed with Dr. Hewitt that the very small pupil was an indication of insufficient anæsthesia, rather than the reverse. Dr. Silk would like to insist upon the importance of preparing the patient for the administration of an anæsthetic, not merely for three or four hours previously, but for twenty-four hours or so, keeping him in bed and clearing the bowels. In the presence of untoward symptoms, he advocated the inversion of the patient, a proceeding which had often yielded excellent results.

Mr. G. Rowell observed that if they were to rely upon any one sign of chloroform anæsthesia, then complete fixation of the eyeball was perhaps the most reliable. This sign was in reality more significant than the condition of the pupil. Slow and slight movement was frequently to be noticed for some half minute after the pupil had reached its limit of contraction. In reference to the sickness, he pointed out that the act of vomiting acted as a powerful stimulus to the heart. The pallor and appearances of imminent syncope which heralded the approach of sickness quickly disappeared on vomiting taking place. Mechanical pressure was perhaps the explanation of this, as, both clinically and experimentally, such pressure was known to excite contractions in a chloroform heart. He referred to Dr. Kelly's method of restoration in cases of danger. The danger of chloroform syncope was for the moment past when emesis had occurred. It was one of the most delicate points in chloroform administration to decide when to push the chloroform and when to desist in the presence of struggling. With reference to the alleged action of chloroform upon the nervous apparatus of the heart, he pointed out that the view that chloroform is a direct poison to the heart muscle has recently received further corroboration from the researches of Pickering, who has shown that even with the nervous element eliminated, the effect of the drug upon the heart remains the same.

Dr. Benham pointed out that the chief dangers attending the administration of chloroform might be obviated by the exhibition of alcohol by the mouth before commencing the inhalation. He instanced the case of a lad who underwent a series of operations at the St. Marylebone Infirmary. Chloroform was used—on the first and third occasions without any ill effects, but with alarming symptoms on the second and fourth, artificial respiration having to be resorted to. Enquiry elicited the fact that on the two occasions when the anæsthetic had been safely taken, brandy had been previously given, but on the other two occasions it had been omitted. Having discovered this fact he had taken care that when chloroform was used subsequently, both in this same case and in all others, some brandy should always be given beforehand: and no further trouble occurred. He thought this was a point of very great importance, and he expressed surprise that professed anæsthetists had not alluded to it. The good

effects of this combination of alcohol with chloroform were probably similar to those of the A.C.E. mixture, but the method was simpler. He suggested that it would be advisable that in all reported fatal cases it should be noted whether alcohol had been given beforehand or not.

The PRESIDENT said that there were two classes of persons at any rate who were not "heartily tired" of discussing the relative advantages of the various anæsthetics, viz., surgeons and their patients. On the contrary, they were anxious to have the question as to their respective safety decided once and for all. He observed that many surgeons would on no account allow chloroform to be used to their patients, and this they surely would not insist upon if they did not attach considerable importance to the choice of the anæsthetic. Others, though they preferred ether, admitted chloroform for certain operations in which it was important to avoid congestion. Then, too, some anæsthetists when asked to give chloroform preferred to commence anæsthesia with ether, maintaining it afterwards with chloroform. They must all have some reason for proceeding thus, at least he supposed they had. He referred to the large number of deaths which took place in the hands of Clover and Potter at a certain time. The latter even said that if another death occurred in his hands he would relinquish his calling as an anæsthetist. Another death did occur soon after, and he kept his word. He had remarked to the speaker the curious fact that the deaths could never be satisfactorily accounted for, and that death took place in so short a time that really nothing could have been done either during or after its administration to avert the fatal result. He pointed out that the proportion of deaths under chloroform had been put at 1 in 2,500, whereas that under ether was only 1 in 7 or 8,000. That, he pointed out, was a big difference, and if patients were aware of the difference he opined that few would select chloroform. They were always seeing the announcement of "death from chloroform," while it was extremely rare to hear of a death under ether.

Mr. DAVIS pointed out that professed anæsthetists gave far more ether than chloroform. This was not because it was easier to give; on the contrary, anyone could hold a chloroformed pad over the face of a patient until the latter either went to sleep or died; but it required some skill to administer ether. He himself never thought of commencing anæsthesia, in the young adult, with chloroform. He always began with gas and ether, giving the chloroform to maintain anæsthesia afterwards if necessary.

Dr. EDMUNDS read extracts from Snow's work showing that 18 minims of chloroform in an adult system was amply sufficient for surgical anæsthesia; and he compared with Snow's statement some evidence recently given at a Dublin inquest, when the medical witness deposed that "he gave deceased about 50 drops of chloroform—a much smaller quantity than was usually given—it usually took from 4 to 6 drams to produce the desired effect before ether was given. As, however, the man looked nervous, witness gave ether, which had the effect of stimulating the heart and counteracting the depressing effects of chloroform. He seemed to take it well, but his colour and pulse did not improve, and witness discontinued the anæsthetic and took immediate steps to restore him. At first he rallied and then relapsed. Every possible effort was made to restore him." Dr. Edmunds asked how such opinions could be reconciled with the demonstrations of Snow that 18 minims in the adult system produced surgical anæsthesia? Dr. Snow also particularly insisted upon giving the chloroform slowly at first. When the chloroform was given

slowly there was no cough, no resistance, no struggling, no holding of the breath, and no fatal gasping in of an atmosphere which had become nearly saturated with chloroform in the ordinary form of inhaler. Dr. Edmunds urged that the danger really lay in the method of administration, and that with an inhaler through which the in-draught of air lay over a mass of lint saturated with chloroform there never could be safety in the hands of any anæsthetist—however skilful and however lucky he might, for a time, be. Dr. Edmunds pointed out that Snow had never been able to devise an inhaler by which the dosage and the percentage of chloroform in each inspiration could be precisely determined and controlled. But, by means of the improved Junker inhaler with the feather indicator as now made by Krohne, this had been accomplished, and the movements of the respiration were made manifest to every one in the room. In this new inhaler the air-way was entirely free at all times, and it never contained any chloroform to be inhaled fatally by a gasp. The dosage of chloroform vapour was projected into the air-way at each inspiration and only when consciously pumped in by the hand of the anæsthetist. By closing the hand more or less completely upon the ball, a minute fraction of a grain of chloroform could be regularly infused into each inspiration, and the dosage could be gradually increased until, at the end of four minutes, perfect anæsthesia was produced and no chloroform was lost. Coughing, resistance, arrest of breathing, all meant clumsy and ill-regulated administration, and it was only by means of such an inhaler, in which the air-way was absolutely free from chloroform unless when charged for the instant by the anæsthetist, that chloroform could be given with comfort and safety.

Mr. White, in reply, admitted that it was very important to be able to regulate the quantity of chloroform administered. Mr. Clover had invented an instrument for the accurate apportionment of the chloroform vapour which answered its purpose admirably, though it was somewhat cumbersome. He had made use frequently, almost constantly, of the improved Junker's inhaler, and he had employed it with the greatest satisfaction. It was, in fact, an admirable instrument. With the ordinary way of giving chloroform one had to judge of the amount actually inhaled by the physiological effects, but he had purposely avoided entering on the question of the various methods of giving chloroform. He himself had remarked the absence of disagreeable after-effects when the A.C.E. mixture was employed in the case of elderly people, and he had come to the conclusion that it was a more satisfactory agent than either chloroform or ether alone. He, too, had noticed the fact that strong subjects almost invariably struggled.

March 5th, 1894.

THE ELECTRICAL TREATMENT OF INFANTILE PARALYSIS.

By H. Lewis Jones, M.D. Cantab., M.R.C.P.

The points brought before the notice of the Society in this paper are some which have cropped up from time to time in the past three years of work in the electrical department of St. Bartholomew's Hospital, where I have had opportunities of continuously watching the progress of many cases of infantile paralysis for long periods of time.

The long lasting paralysis and atrophy which this disease so often leaves behind it tend very greatly to discourage all attempts at treatment, and, indeed, it is only by watching and treating patients for months or years that their slow and gradual improvement becomes perceptible. As the result of an electrical testing which has shown seriously impaired reactions, many people have been told that their children were beyond reach of treatment in the more severe cases. It is quite certain, though, that prolonged electrical treatment will do much good to nearly all cases of infantile paralysis, provided that the children are young and not more than two or three years have gone by since the incidence of the disease. Even after that lapse of time something may be done.

In an electrical department cases of infantile paralysis are apt to collect together in great numbers, and, indeed, they may become so numerous as almost to monopolise the whole energies of the department. Soon after commencing the electrical treatment of this disease it occurred to me one day that the numbers in attendance were becoming unmanageable, and that it might perhaps be as well to discharge some of the most unpromising cases, but I found that the mothers of the children were unanimous in declaring that the treatment was doing good, and that they all begged to be allowed to continue attending longer. As this was encouraging, I thought it would be profitable and interesting to watch the cases more closely and for a longer period, in order to see whether

some satisfactory progress might not be gained. Since then I have been able to discharge very considerably improved a fair number of children who came under treatment in a more or less crippled condition.

There is a formula in which the prognosis of infantile paralysis has been commonly summed up. It is as follows :—If the ganglion cells supplying the muscle are destroyed recovery must be impossible, and if the cells are not destroyed treatmeut is unnecessary, because the patients will get well of their own accord. This formula, I am sure, has done a great deal of harm, for it is widely accepted because it saves such a lot of trouble. But it starts from the assumption that the disease either must destroy all the motor cells of a muscle or else must leave them all uninjured, and this assumption is certainly not correct. On the contrary, the damage to the motor cells may be of any degree of severity or of any extent, and the paralysis may vary between slight weakness and complete loss of all motor power.

It is quite reasonable to suppose that a lesion in the motor tract of the cord may destroy some of the nerve cells of the nucleus of origin of a muscle, while others in the same nucleus may escape, and this might especially be the case if the nucleus of origin is an extensive one. Although the nuclei in the anterior cornua have not yet been mapped out into groups corresponding with the muscles they supply, yet there is evidence to support the view that many of these centres extend for an appreciable distance longitudinally in the cord. Dr. Sherrington, than whom there can be no better authority on this point, in an exhaustive paper on the lumbo-sacral plexus, based on experimental researches in monkeys and other animals, clearly takes the view that some at least of the nuclei of origin of muscles in the anterior cornua may occupy an area of considerable extent, and in the plate which accompanies his paper in vol. xiii of the 'Journal of Physiology' he represents the nerve supply to many of the muscles of the leg as arising from the cord at two or three separate levels.

If this be so in the human subject one can readily understand how a muscle might be partly crippled by poliomyelitis and yet retain a more or less complete degree of voluntary power through the support of such of its ganglion cells as might happen to survive. There is also the possibility of neighbouring cells taking up the work of those destroyed. The object of electrical treatment

should then be to stimulate and develop any surviving fibres, and if possible to make them numerous enough and strong enough to form an useful muscle.

Duchenne long ago pointed out that a muscle crippled by infantile paralysis may still contain a few living functional muscle fibres, and that these may easily be overlooked in an ordinary electrical examination of the muscle, but that they may be successfully cultivated by persevering treatment. There is no doubt that cases admitting of such an interpretation do occur; for example, I have seen quite a respectable sized mass of calf-muscle develop in a limb which for two years at least had shown no trace of electrical reaction of any sort in that region, and the same in other muscles, notably in a deltoid muscle which, after remaining for nearly three years completely atrophied as the remnant of an extensive paralysis of the upper arm, is now beginning to grow, and to show faint contractions of normal quality to the induction coil.

A muscle which is greatly atrophied, and in large part the seat of fatty degeneration, may still contain a fair number of active muscle fibres scattered in it, and these may remain in a dormant state for several years and yet be capable of great development if eventually they come under electrical treatment. Duchenne has related several cases of this sort, where treatment commenced as late as four years after the onset of the disease gave most favourable results.

Through the kindness of Mr. Langton I have had an opportunity of testing and dissecting the muscles in an amputated leg the seat of severe infantile paralysis of old standing. The age of the patient was 20 years, and the limb had been diseased from childhood. The muscles of the leg were all extremely atrophied, degenerated, and fatty; in fact, the calf was almost indistinguishable from adipose tissue, but still contained a sufficient number of normal muscle fibres to make it contract fairly briskly to the induction coil current. The other muscles of the limb, though in a state of advanced atrophy, also contained fibres which were able to respond either to the induction coil or to the galvanic current.

The majority of the cases of infantile paralysis with which I have had to do are those with paralysis of the leg muscles, and in many of them a year or two years or more has elapsed since the

incidence of the disease. Apparently the lower limbs are much more commonly affected than the upper, but this may be partly accounted for by the sources from which the electrical department at St. Bartholomew's Hospital is supplied, for a large number of cases are sent over by Mr. Walsham from the orthopædic department, having been brought there in the first instance because of some lameness. Among the poor it often happens that the paralysis is overlooked or neglected until the time has come for the child to begin to walk, and then, or sometimes even later, an effort is made by the parents, and the child is brought for medical advice. I mention this in order to show that these cases have, many of them, been left to improve spontaneously before coming under treatment, and in fact that they are cases of old standing, who have undergone what is called expectant treatment without recovery. The material then is not of the most favourable kind, and some of them are in a sorry plight, but all the cases that come, however hopeless they may look, are put under treatment, and all improve, some only a little, others very much.

Among the cases two different types exist. In one the muscles are thin, but they present reactions which, though weak, are normal in quality both to the induction coil and to the constant battery. In the other group the muscles are paralysed, atrophied, and show only a reaction of degeneration, or even no reactions at all.

It cannot fairly be said of the first group that they will recover spontaneously, their very presence in the department shows that they have failed to do so. Under treatment they usually begin to improve from the first, and as a rule do very well, but even so their improvement is often a gradual one, requiring treatment for months. When these cases have ceased attending for a time and they are again brought back, the history is usually that the progress of the muscles went on for a time and then ceased, therefore they are brought again for further treatment; others do better and recover completely from the first, but the affected limb commonly remains rather thinner and rather weaker than its fellow.

I do not wish to imply that no muscle paralysed by poliomyelitis recovers spontaneously, it is certain that many do so recover, but rather that there are many cases which remain in a state of very imperfect recovery, even though their electrical reactions are

normal, and that these derive immediate benefit from systematic treatment.

With cases of the second class, namely those with great atrophy, paralysis, and the reaction of degeneration, it is also too sweeping a statement to say that they are incurable, and that treatment can do nothing for them. Electrical reactions do return in muscles which before showed no signs of contraction, and this I have seen a fair number of times; in particular I would mention a patient brought to the hospital at the age of 3, with a history of paralysis having come on at the age of $4\frac{1}{2}$ months. She had been an in-patient for four months at Queen Square, and while there recovered power in her arms and back, which had been powerless at first. Treatment commenced in June, 1891. No reactions then in any muscles of either leg, extreme wasting, and talipes varus in the left foot. Patient quite unable to stand. The improvement has been very slow, the attendance very regular; at present her legs show reactions to the induction coil in very nearly all the muscles on both sides, the talipes has gone, and she can walk, though in a rather awkward manner, owing mainly to the state of one quadriceps extensor muscle, which continues very thin and weak. This child, although still very feeble in her legs, has made and is still making progress, and is a clear instance of the return of voluntary power and normal electrical reactions in muscles which at one time seemed to have fallen into the last degree of atrophy and paralysis.

Two similar cases of which I have notes are the following :—

F. P., æt. 5, paralysis for four years, return of normal reactions after six weeks' treatment.

C. T., æt. 11, paralysis for eight years, return of normal reactions after 18 months' treatment.

Many more similar cases could be quoted.

The routine treatment adopted at St. Bartholomew's with the infantile paralysis cases is as follows :—At the first visit the muscles are tested, the girth of the affected limb measured, and the voluntary power of the paralysed muscles ascertained, and any faulty attitude of the limb noted. The mother is then told that the child must be brought twice a week to the department for six months at least, for electrical treatment, and she is further told to bathe and manipulate and rub the affected limbs every night for a quarter of an hour in hot water. If irons or other orthopædic

appliances are worn the child is to be encouraged to exercise its limbs without them for a little time every night before the evening bath. By impressing upon the mothers the need for patience and perseverance one is able to ensure their hearty co-operation, and this is the most important factor of all. The electrical treatment of the children is for the most part carried out at the hospital by the mothers themselves, who are shown how to use the electrodes, and quickly learn what is required. A very fair proportion of the total cases settle down into regular attendance. Those who fall away do so usually in the earlier months of treatment, those who remain remain long.

The first signs of improvement are a better circulation in the affected parts, and disappearance of chilblains and sores, and a gradual gain of voluntary power.

The return of electrical reactions comes later, and it is common when all contractility has been lost for the normal reaction to the induction coil to return without an intermediate stage of contraction to galvanism only. This may perhaps be explained by supposing that the few latent normal fibres in the wasted muscle have began to grow and gain sufficient strength to produce a visible contraction.

The apparatus used :—Both the induction coil and the constant current battery are employed for the electrical treatment. Custom has selected the constant current for the treatment of muscles showing the reaction of degeneration, reserving the induction coil for the less severe cases in which the muscles retain the power of contraction to the currents of the induction coil. This choice of current is probably based on theoretical grounds. It is true that a muscle showing the reaction of degeneration will contract to the constant current only, and in so far as the contraction of the muscle is a good thing for the muscle the constant current may be better than that of the induction coil; but it is by no means certain that the amount of benefit can be measured by the amount of contraction set up in the muscle. A muscle which is completely cut off from its nucleus of origin will continue to degenerate and waste, however persistently it be made to contract by treatment with the constant current. This matter of the relative advantages or virtues of constant and interrupted current dates from a long way back. Each has been warmly advocated by its

partisans as being superior to the other since the days of Duchenne and of Remak.

But in paralysis any form of electrical application is of value simply as a most convenient way of stimulating the activity of the living tissues of the part under treatment, and, as a matter of fact, even with the constant current of a battery the stimulation is chiefly obtained when the current is made to vary by interruptions or reversals, or by movements of the electrode over the surface.

The recent investigations of Messrs. Gautier and Larat seem to show clearly that varying currents have a greater stimulating action on the tissues than steady currents, and that the former promote the metabolic activity of the living cells to a very much greater extent than steady currents do, and in practice I have found that the interrupted currents of the induction coil have quite as high a value in the treatment of infantile paralysis as the constant current of a battery.

When the treatment has to be put into the hands of a nurse the induction coil is the best, because it is more easily managed and kept in order, and the vibrator with its buzzing sound serves to show that the apparatus is working, and the strength of the current can be readily gauged by feeling it.

Whenever children are to be treated by electricity great care must be taken not to frighten them by sudden shocks, the current used must never be so strong as to alarm them or make them cry, and it is important that the contact breaker of the coil shall work very smoothly and evenly. Many coils are defective in the matter of contact breaker; until lately there has been little attention given to it, and any sort of vibrating spring was thought good enough, but there is all the difference in the world between a good and a bad one. The difficult problem of testing a child's muscles without making it cry becomes much easier with a good coil and a smoothly acting contact breaker working about 40 or 50 times a second. Of all the coils I have tried those of Gaiffe, of Paris, seem to me to be the best.

It is perhaps a little premature to discuss the value of the electrical supply from the house-lighting mains, as I have not yet had opportunities of trying it upon cases of infantile paralysis, but from general considerations of the quality of current on the alter-

nating system of supply I am disposed to think that that form of current properly applied through a transformer should be of distinct value in the treatment of infantile paralysis.

When the lower limbs are the seat of the paralysis an improvised electric bath is an excellent method. An ordinary wooden tub or earthenware foot-bath filled with warm water is taken, the electrodes in the form of plates of metal are suspended at the two ends, and the child dressed in a short waistcoat is put into the bath in a sitting position. The current is very well borne in this way, and the whole extent of the paralysed parts comes simultaneously under treatment. This plan can easily be carried out at home by the nurse or mother of the child. The strength of the current is gauged by putting the hands into the tub, one at each end. This plan requires no special knowledge of anatomy, it is simple and efficient, and is therefore likely to be persevered in, and this question of perseverance over long periods of time is the key to success. Even if only one of the lower limbs be affected, there is no reason why the bath should not be used, and if the sound leg be flexed and drawn up most of the electrical current can be diverted into the affected one.

In conclusion, I would give as a summary of the position :—

1. It is important in every case of infantile paralysis which has lasted over four weeks to try electrical treatment, continuing it for six months or a year, or longer, if necessary.

2. It is the exception for a muscle to be so completely destroyed by poliomyelitis as to have no functional fibres left, and great development of these remaining fibres may be gained by persevering stimulation of them.

3. Where the electrical reactions are reduced to the very lowest flicker, or even entirely abolished, some improvement may be hoped for.

4. Where the electrical reactions are not altered in quality, it is not good practice to leave the case to take care of itself. Electricity acts only as a stimulating treatment, but it is superior to any mechanical stimulation by rubbing or massage. It may advantageously be combined with these. The form of electrical stimulation to be employed is less important than the need for perseverance.

The induction coil with or without the bath is quite easily arranged for use by the mother or nurse of the patient.

Dr. Pasteur observed that the author had done very useful work in calling the attention of practitioners to the necessity for perseverance in the treatment of these cases of infantile paralysis. His own experience had been comparatively limited compared with the author's, but he was enabled to endorse what he had said with respect to the remarkable improvement that sometimes followed persistent treatment even in apparently hopeless cases. At the North Eastern Children's Hospital, where he had for some years made it a rule to submit these cases (practically without selection) to prolonged electrical treatment, it only rarely happened that some definite improvement did not occur.

Dr. Cagney congratulated the author on his paper and, as having had the opportunity of witnessing the results in a number of the cases referred to, he thought it only becoming that he should state his concurrence in the author's observations. He, himself, had treated a great number of cases of infantile paralysis during the last ten years, and he always endeavoured to impress upon his students at St. Mary's that if they did nothing else during their career, but patiently and hopefully treat a number of these cases they would do more useful work than many a busy man. There was, he said, no lesion of the nervous system, or of the human body, which was at once so pitiable, so curable, and so neglected. He had seen cases improve in a marked degree after years of neglect, and he referred as an extreme instance to a case in which the patient had been in hospital ten years previously for an attack of infantile paralysis and had left with a perfectly useless upper extremity. It came under his care a few months ago, and the improvement that had already taken place was such that he was sanguine of obtaining with perseverance a very useful member. He pointed out that in all probability a large number of cases which were diagnosed to be due to anterior poliomyelitis were instances of peripheral neuritis. Their knowledge of anterior poliomyelitis was possibly less complete than they imagined, and this enhanced the probability of many of these cases being peripheral neuritis. He fully believed that growing children were as liable to disturbances of the peripheral nerves as adults. It was assumed that such cases in practice were very rare, whereas actually he believed them to be common. For this reason and others, he entered his protest against the sentence of incurability which he believed to be too hastily pronounced. He suggested that it would be unwise to trust to electricity alone, for he had found, *inter alia*, that the results were immensely enhanced by subcutaneous or intra-muscular injections of strychnine.

Mr. Walsham confirmed what the author had said as to the very great benefit accruing from steady perseverance in the treatment of these cases. Before the author's taking charge of the electrical department he had remarked that the cases of infantile paralysis sent by him to that department derived very little benefit, but since he, the author, had devoted himself to the carrying out of the treatment the results had in many cases been admirable. He pointed out that the effect of electricity was often materially enhanced by previous tenotomy in order to overcome the contraction of the opposing muscles to those paralysed. The latter, when thus relieved from this stretched condition, were in a better position to respond to the electrical treatment, and what fibres remained undegenerated could then by perseverance be brought into use.

Mr. Lockwood agreed that some of these cases required tenotomy for the relief of equinus, and he pointed out that the fact that the electrical reaction of the affected muscles was good, did not imply that they would

not subsequently undergo wasting, for very often after the operation they got the characteristic drum-stick leg. This condition had at times improved under the electrical treatment carried out by an expert. He did, however, believe that it could be efficiently carried out by the mothers or by nurses as suggested by the author. Even practitioners who undertook this treatment often failed to obtain good results. He pointed out that anterior poliomyelitis was probably not in itself a disease, but rather the result of a febrile malady probably infective in character. This was a field of original observation of which he hoped some one would avail himself.

Dr. James Taylor pointed out that though cases of anterior poliomyelitis did always improve, yet in 99 per cent. of the cases some permanent trace remained of the attack. He, himself, attached very great importance to the electrical treatment, but they were too apt to overlook the immense importance of the other therapeutic measures of which electricity formed a part. He referred to Gowers' aphorism "that the amount of good to be derived from electricity depended upon the amount of contraction produced in the affected muscles by the current"; and said he had seen nothing in his experience to invalidate that view. He dissented from the view that the Faradic current was capable of doing as much good as the galvanic current in most cases. In many cases no contraction was produced by the Faradic current, whereas a contraction could be excited by the judicious application of constant current, and, in such cases, benefit could only be expected from the use of the current which caused contraction. He thought that the treatment gave the best results when carried out by the medical man himself. The amount of improvement in cases of infantile paralysis was certainly much greater now than some years ago, and this he attributed, in a large degree, to the persistence with which the treatment was followed. He thought there could be no doubt as to the occurrence of peripheral neuritis in children, but he had never seen it occur unless associated with symptoms of anterior poliomyelitis as well. Peripheral neuritis was more or less a curable disease; but these cases, in which it occurred in this association, were not curable, and the disabilities were the same as from anterior poliomyelitis. They were not acquainted with the nature of the initial disturbance, but the fact that evidence of central and peripheral lesions were sometimes present in the same case, indicated that it was an infective disease. He feared that they inclined to look upon anterior poliomyelitis as an incurable disease, but he was convinced that much harm was done by requiring the victims to use forthwith various apparatus to remedy the resulting mechanical inconveniences, instead of persevering in the electrical treatment until improvement had ceased to take place.

Dr. Lewis Jones, in reply, admitted that the treatment could be best carried out by the medical man himself; but where, as in these cases, it had to be perserved with for such long periods of time in order to get good results, and seeing that daily treatment was desirable, it was almost impossible for the medical man to give the necessary time. For that reason he had endeavoured to contrive an apparatus for home use and had recommended the foot-bath plan of treatment. It was easy to make the bath become a part of the child's daily routine, and, when persevered in, it gave very encouraging results. He hoped that medical men generally would learn to recognise that much could be done by electricity, especially as so little could be done by any other alternative form of treatment. He agreed that some of the cases reputed to be anterior poliomyelitis

were possibly of another nature. He would not hazard a guess as to the nature of the cause of acute poliomyelitis; it might be infective or otherwise. He had not met with its simultaneous occurrence in several members of a family. In only two out of 150 cases had he known of a second attack in the same individual. He did not agree with the view that the good that could be done by electricity could be measured by the amount of contraction set up in the muscle, because the current not only stimulated the muscle fibres, but acted on all other tissues in the limb, and also stimulated the centres in the cord reflexly through the sensory nerves. A current which produced no visible contraction of the muscles still increased the metabolic activity of the tissues. Moreover, one might go on making a muscle contract by galvanic currents for months without retarding its degeneration if the muscle were completely and hopelessly cut off from the central nervous system. The good to be obtained depended upon the survival of some muscle fibres and some motor nerve cells in nearly all cases of infantile paralysis, and he thought that the effect of treatment was not to renovate old and degenerate fibres, but to stimulate the remnant of normal fibres into fresh growth. He agreed that tenotomy was of service by allowing muscles greater freedom of movement, and this prevented them from wasting through disease. The cases referred to by Mr. Lockwood, in which wasting was persistent in spite of good electrical reactions, called for prolonged treatment by electricity and gymnastics. Cases of that kind were sometimes tedious, but improvement always followed, and there was no other way of treating them.

A CASE, DIAGNOSED AS TUBERCULAR MENINGITIS, TREATED BY TREPHINING AND DRAINAGE OF THE SUBARACHNOID SPACE; RECOVERY.

By Wm. Wallis Ord, M.D. Oxon., M.R.C.P. Lond., &c., and Herbert F. Waterhouse, F.R.C.S. Eng., M.D. Edin.

A girl 5 years of age was admitted into the Victoria Hospital for Sick Children, Chelsea, on October 23, 1893. Up till five weeks previously she had been perfectly well, and had never had any fits or otorrhœa; but about the middle of September she began to suffer from acute pain in the head. She had occasional vomiting, she was very fretful, her appetite was bad, and her bowels were constipated. There was no history of tubercle in her family. When first seen the child presented a dull, heavy appearance; she was very restless and uttered from time to time a shrill scream. When asked if she felt pain she put her hand to her forehead; she lay with her head bent forward and her legs drawn up. The temperature was 101·6° F., the pulse was 104, regular and weak in volume, and the respiration was 20, regular.

There was no lesion discoverable in the thoracic or abdominal viscera. Tache cérébrale was well marked; the knee-jerks were normal. There was commencing optic neuritis in both eyes, being less marked in the right. During the first night she was very restless, constantly screaming. There was no vomiting, but she took food badly. The optic neuritis became more marked. On the night of October 25 she was evidently suffering from great increase of pain. She screamed almost without intermission from the evening of that day until 6 A.M. on October 26. There was no retraction of the head nor vomiting. The pulse at 2 P.M. was 108, regular. She referred the pain to the frontal region. When the patient was seen again by me at 3 P.M. she was evidently worse. I then asked my colleague, Mr. Waterhouse, to examine her with me. We found the pulse to be wavering in a striking manner. At one time it was 120 per minute and regular, on a second occasion it was 70 per minute, with several intermissions, and two or three minutes later it was 80, with no intermission. The respiration was regular, but inspiration was long-drawn. The child was lethargic and apathetic, except for the typical hydrocephalic cry she uttered at times, and she lay on the left side with the lower limbs slightly flexed on the abdomen. She had the appearance of one rapidly passing into a state of coma. The abdomen was retracted, the face was pale, and the tache cérébrale was well marked. The temperature was 101°. On examining the eyes we found that the pupils had been dilated with homatropine, and therefore no account can be given of their size and mobility, but the notes stated that they had been contracted on admission and had become more dilated before the homatropine was instilled. There was no ptosis or strabismus as far as could be ascertained. Upon ophthalmoscopic examination optic neuritis was found, being marked on the left and less marked on the right side. The ears were examined and the membrana tympani was seen to be healthy on both sides. We agreed that the child was suffering from tubercular meningitis, that there were distinct signs, as evidenced by the great pain and optic neuritis, of increased intra-cranial pressure, that the child was rapidly approaching the stage of coma, and that if such pressure should be unrelieved, there was every probability of death taking place in a few hours from compression. On these considerations we agreed that an operation for the relief of the pressure was both justifiable

and advisable. It was decided to open the subarachnoid space, and to drain this space for a few days. There was some doubt in our minds whether to open the subarachnoid space of the brain or of the spinal cord, but eventually it was decided that the opening should be made into the cranial cavity, and we feel convinced that this was the right decision. Accordingly at 5 P.M. the child was placed under chloroform, and, after the scalp had been shaved and rendered aseptic, a curved incision about $2\frac{1}{2}$ inches in length was made over the left cerebellar fossa of the occipital bone, commencing below and behind the mastoid process, passing with its convexity upwards, and ending externally to the external occipital crest. The occipital artery bled furiously and was tied, and the pericranium was raised in a flap corresponding to the scalp flap. There was some bleeding from the torn mastoid vein. A trephine, three-quarters of an inch in diameter, was then applied midway between the external occipital crest and the mastoid process. The disc of bone removed was placed in warm boric solution. The dura mater bulged tensely into the trephine opening, and no pulsation was observable. The dura mater and arachnoid were then incised, and some 30 drops of a slightly greenish serous fluid escaped. The cerebellum then bulged into the foramen in the skull, fitting it tightly, like a cork in a bottle. A silver probe, the terminal half-inch of which was bent to a right angle with the rest of the instrument, was then inserted between the cerebellum and the arachnoid inwards towards the falx cerebelli. As soon as the latter was felt the probe was rotated, so that the end projected forward into the large subarachnoid space between the cerebellum and the medulla. Some drams of the serous fluid at once escaped. A drainage-tube was then passed along the probe and left in position; it was found that fluid passed slowly along it. The dura mater was then sutured, and the disc of bone having been cut up into small fragments with bone forceps, these were packed carefully in a mosaic, after the manner of Professor Macewen, so as to fill the foramen, leaving only room for the drainage-tube in the centre. The latter was then brought out through a hole made in the centre of the flap; the flap was readjusted with horsehair sutures, and the wound was dressed with cyanide dressings. The child bore the operation well, and the pulse rose from 80 to 120 on the removal of the fluid.

The after history of the case, largely obtained from notes made

by the house surgeon, Mr. C. J. Harrison, was as follows:—"October 26, 11 P.M.: The child is doing well, and the temperature has fallen to normal. She has been a little sick during the evening, but she has not shrieked or had any convulsive movement.—27th: The child has passed a good night; she vomited twice; the pulse is 112, and the temperature 99° F. At 6 P.M. the temperature rose to 102·6°. The wound was dressed; the dressings were soaked with blood-stained serous discharge.—28th: The child is sensible, and answers questions; she has passed a good night. The temperature (2 P.M.) is normal; it rose to 103° at 6 P.M. At 10 P.M. it was 101°. The optic neuritis is less marked than it was before the operation, but it is still more noticeable in the left eye than in the right.—29th: The child is better. The temperature (6 P.M.) is 102°; she takes food well. The discharge from the wound had soaked through the dressings, which were voluminous, and were serous in appearance; the dressings were changed.—30th: The patient has slept pretty well during the night. The temperature was subnormal at 10 A.M. The wound was dressed, the dressings being soaked with a colourless discharge, evidently cerebro-spinal fluid. In the afternoon Mr. Holmes Spicer kindly examined the child's eyes and reported as follows: 'Both discs are in the same condition. A considerable amount of glistening white effusion, extending for some distance from the optic disc, is present. The veins are engorged and somewhat tortuous. No hæmorrhages or tubercles of the choroid can be seen.'—November 2 and 4: The wound was dressed, the dressings being soaked with serous discharge: the wound appeared healed except where the drainage-tube emerged.—6th: The wound was dressed; it appears to be breaking down in parts; the stitches were removed; the child vomited several times during the day.—From November 6 to the 20th the wound suggested strongly a tuberculous infection, with its gelatinous-looking granulations and thin watery discharge. The tube was removed on the 13th. The temperature during this period varied from subnormal to 103·4°, rising and falling fitfully. —On the 20th Mr. Spicer reported: 'There is a considerable amount of swelling of both discs, but more in the right than in the left. The margins are indistinct, but there is less of the glistening white effusion than there was when the last note was made. About this time two small granulations were removed from the wound, but the examination of them by Dr. Arkle proved negative.

—27th: During the preceding week the child has improved remarkably. Mr. Spicer reports: 'The condition of the eyes is much the same as last week. The top of the disc can be seen with +6 D.' The wound was dressed with boric ointment and there was very little discharge.—On November 30 the child was apparently quite well. She sat up to her meals at the table in the ward; she said that she felt quite well, and had had no headache 'since she had the chloroform.' The temperature fell to 98° on November 18, and never rose after that above 98·8° until the middle of December, when the child had an attack of measles, from which she recovered without a bad symptom."

Personally I had for some years considered that early operation for the purpose of relieving the effusion in cases of meningitis was a method of treatment that should be tried. I think I was originally led to this by reading a passage by Professor Henoch of Berlin in a clinical lecture on tubercular meningitis. He says: "I do not regard it as impossible to bring about recovery by opportune treatment at the beginning of the cases, when the tuberculosis is not general but localised, as our main object at this stage is to arrest the commencing inflammation of the pia mater, and to prevent a more extensive exudation, which might affect the cortical substance of the brain."

We think that we may fairly state that this was a case of acute meningitis with effusion, but the fortunate result renders it impossible for us to state absolutely that it was of a tubercular nature. The condition of the child, however, was that with which we are accustomed to associate tubercular meningitis, and there was not one of the eight medical men who saw the case first before operation who did not concur in our diagnosis. In operating early we were guided by the consideration that this mode of procedure should be attempted, if possible, before any marked signs of pressure have become developed, as we consider that the amount of pressure necessary to produce all the classical symptoms may come dangerously near causing permanent cerebral lesion. Gowers* says: "If the stage of coma has been reached, death is almost certain." To those who may say that it could not have been a case of tubercular meningitis because the patient recovered, our answer would be that this is no argument, for it would have been used 20 years ago in a case of tubercular peritonitis. That there is

* "Diseases of the Nervous System."

spontaneous cure in a certain number of cases of tubercular meningitis is stated by Bristowe,* Henoch,† Hillier,‡ Osler,§ Jacobi,‖ Ord,¶ Gowers,** and other authorities. For instance, the last-mentioned writer says: "Unquestionably cases recover in which the existence of meningitis admits of no doubt, and in which there is a strong presumption that the inflammation is tuberculous, although the recovery removes the possibility of rigid proof." Many of us here have seen remarkable cases of cure, apparently permanent, from tubercular peritonitis as the result of laparotomy and removal of fluid, and we take it that, supposing, as we believe, our case to have been of a tubercular nature, the *modus operandi* of cure was somewhat similar. We think that it will be admitted that in tubercular peritonitis in children there are two types: (1) the dry, doughy type, with much tubercular formation and little fluid; and (2) the type in which there is a large quantity of fluid and but little tubercular material. Everyone will, we are sure, admit that it is in the latter class that we obtain the best results from abdominal section and the removal of fluid. We think we may reasonably suggest that there are the same two types recognisable in tubercular meningitis. All of us have seen in the dead-house cases of this disease in which there was a large amount of tubercular formation and but little effusion, and, on the other hand, cases in which, though the tubercles were comparatively few, and limited perhaps to the Sylvian fissure, the fluid effusion was large in quantity. Our belief is that the case in question was of the latter type. The temperature is very suggestive of tubercular meningitis, and it is certain that if its hectic character from October 23 to November 18 had been due to a tumour, large or small, either of tuberculous or gliomatous character, this symptom would have persisted. Yet on November 18 the temperature fell to normal, and has remained normal or subnormal ever since. We think that this alteration in the character of the temperature may point to the arrest of a tubercular process. If this was not a case

* "Theory and Practice of Medicine," fifth edition, p. 990.

† 'Lectures on Children's Diseases,' 'Sydenham Society's Transactions,' p. 317.

‡ "Diseases of Children." Article, 'Tuberculous Meningitis.'

§ "Principles and Practice of Medicine," 1893, p. 204.

‖ "Keating's Encyclopædia:" Article, 'Tuberculous Meningitis.'

¶ Ord: 'St. Thomas's Hospital Reports,' 1878.

** "Diseases of the Nervous System."

of tubercular meningitis, what, then, was it? It was evidently a meningitis, accompanied by effusion, and we submit that the balance of probability is in favour of its tubercular nature. The hectic temperature, the occasional vomiting, and the persistence of the optic neuritis all tend to support this view. As regards the last symptom we think that all who have had experience of ophthalmoscopic work among children will agree that the tubercular meningitis is the commonest cause of double optic neuritis in them. As regards the type of neuritis, we think it probable that it was not "choked disc" or engorgement neuritis, but neuritis caused by direct transmission of inflammation from the meninges to the optic nerve, such as, according to Fuchs and von Graefe, usually occurs in tubercular meningitis—the "neuritis descendens" of continental writers. The behaviour of the wound also deserves some attention; it healed rapidly by first intention, and then began to break down in parts on the eleventh or twelfth day after operation, healing soundly, however, after a few days under the free use of iodoform. This is the condition so often seen in the recent scar after operation for surgical tuberculosis; but we do not wish to attach too much importance to this point, as it is to be remembered that the wound was for several days soaked in cerebro-spinal fluid. A most noticeable point is that none of the pieces of bone implanted came away, but the fragments have evidently now grown into a firm disc. In connexion with this case we wish to draw attention to two communications to 'The Lancet' by Mr. Parkin* of Hull. Mr. Parkin has related four cases in which he performed an operation of the same nature as our case with complete recovery of one child, who suffered from chronic hydrocephalus. It is interesting to note that, although we had not seen Mr. Parkin's earlier communication previously to our case, the same position was selected for operation in his case as in ours, with the exception of the difference in the side, his being on the right, ours on the left.

In conclusion, we venture to hope that, though we do not pretend to have proved this to have been a case of "tubercular" meningitis cured by operative treatment, we have adduced evidence tending towards establishing the tubercular nature of the case. We both of us feel that in this instance the patient owes her life to

* 'The Lancet,' July 1 and November 18, 1893.

the operation, and in view of the desperate prognosis in this disease and of the successful result obtained by operative treatment in our case, we have ventured to bring this paper before the society.

Mr. Walsham mentioned that some months ago his colleague, Dr. Howard Tooth, had called upon him to drain in a case of supposed tubercular meningitis. He had operated by removing the lamina of one of the cervical vertebræ as being in a more dependent situation. He asked why the author had selected the occipital region in his case. In his own case the child presented well-marked symptoms of tubercular meningitis in a fairly early stage, and when he made the opening the fluid spurted out with considerable violence, testifying to the internal pressure. The child died a day or two later. On opening the skull, no evidence whatever was found of tubercular meningitis, and as a matter of fact they were ignorant of the actual cause of death, though he came to the conclusion that it was not due to the operation, the wound having remained perfectly aseptic. In a case of cerebellar tumour, also under the care of Dr. Tooth, he had trephined in the suboccipital region, and the bleeding from the bone was excessive, so much so that the fatal result was, he thought, in part at any rate, due to the loss of blood. The lesion in the cerebellum was found to be a cyst. In that case too the fluid from the cyst spurted out to a distance, showing the existence of great intra-cranial pressure, and they inferred that the violence of the hæmorrhage was due to pressure on the lateral sinus causing the blood to escape through a number of emissary veins that lead from the sinus to veins outside the bone. This excessive hæmorrhage was another reason for not operating in the occipital region.

Dr. B. Burnett Joll asked whether the fluid had been examined.

Dr. Pasteur referred to several cases treated at the Middlesex Hospital, where it had been a common practice of late years to drain in cases of tubercular meningitis associated with symptoms of intra-cranial pressure. The lumbar region was selected for the purpose, and, so far as the evacuation of the fluid went, it answered very well. In almost every case the children were already comatose before drainage was practised, and, though there was an immediate improvement in their condition, it proved to be only temporary. He also referred to a case in which Mr. Percy Dean had trephined at the North East Hospital for Children in a case which showed evidence of increased intracranial pressure. The symptoms were subacute and the diagnosis doubtful. Coma had supervened before the patient was trephined. A drainage tube was introduced into the lateral ventricle. A marked temporary improvement was observed, but the child died a few days later. There was no meningeal tubercle, but the ventricles were enormously distended, and there was distinct thickening of the arachnoid at the base of the brain. Dr. Pasteur quite agreed with the authors that it was advisable to operate before the patient became comatose.

Mr. Battle observed that there were few, if any, successful cases in which the treatment had been resorted to when the patient was in a condition of coma. There was a great difference between coma and approaching coma. They, as surgeons, were often asked to operate when the child was already comatose, but perhaps the result in this case would have for effect to induce physicians to call upon them to operate earlier. A very important point in the treatment was the continuous drainage for

a period of time. He had been called upon to aspirate in three or four cases of coma—once after trephining the skull—apparently due to pressure consequent on tubercular meningitis; but though an improvement had followed the withdrawal of fluid from the lateral ventricle, the ultimate result had been unsatisfactory. He thought that the replantation of the pieces of bone in this case was rather an unnecessary complication, for not only did it open up the possibility of sepsis from necrosis of the fragments, but there was the risk of the formation of adhesions between the brain or membranes and the newly-formed bone. He had replanted bone in compound fracture of the skull, but would not be inclined to do so by Macewen's method if there were any opening through the dura mater. He could not say anything as to the result in Mr. Waterhouse's case, as he had not had an opportunity of examining the patient.

Mr. L. Bidwell mentioned that in some *post-mortems* on children who had died without symptoms of meningitis during their last illness, but whose histories pointed to previous attacks of meningitis, he had found calcified tubercles on the pia mater. These were probably cases in which the disease must be regarded as temporarily cured. A considerable number of cases, which were diagnosed to be tubercular meningitis, proved, *post-mortem*, not to be tubercular, but to be due to middle ear disease, even where there was no evidence of such disease during life.

Mr. Waterhouse explained that the drainage from the spinal canal had, as a matter of fact, been first suggested, but had been discarded in favour of the occipital region in deference to the opinion of Mr. d'Arcy Power. Their object was to drain the subarachnoid space, and he thought the nearer they got to the large subarachnoid space over the fourth ventricle, the greater chance would there be of a successful result. He had raised the central lobe of the cerebellum over the subjacent medulla. He thought that if the lateral ventricles were distended, as they were expected to be, this method would give greater relief to the intracranial tension. That theory was justified by the result. He thought too that there would be less hæmorrhage than if one burrowed down among the deep muscles of the neck. He made up his mind to drain continuously, and he was convinced that this was all-important. His experience (one case) led him to regard simple tapping as insufficient. The replantation of bone in this case had proved beneficial, for the pieces implanted had grown into a firm disc of bone. He had learned this procedure from Professor Macewen, and practised it in almost all cases of trephining. They had excluded middle ear mischief. He hoped that they might now hope to go a little further in this direction, and that they might be enabled to operate in cases other than these on the lines suggested by Senn in the surgical treatment of septic meningitis in its earliest stages. He hoped specially that this case would stimulate physicians to hand over their cases to the surgeon, as Dr. Ord had done in this case, before the stage of coma had been reached. Once coma was reached, then surgical intervention held out no hope of a successful issue.

Dr. Ord, in reply, said, in reference to the selection of the site of operation, that Mr. Power had pointed out the probability of the inflammation resulting in the closure of the entrance into the spinal canal. He regretted that the fluid had not been examined, first because they felt so sure of its being tubercular, and, secondly, because they really hardly expected a successful issue at the time of the operation. The keynote of success in these cases was early operation and continuous drainage.

March 19th, 1894.

THE DIAGNOSIS OF DIPHTHERIA BY BACTERIOLOGICAL CULTURES.

By F. J. Wethered, M.D., M.R.C.P.

Although cases of diphtheria usually present no difficulty in diagnosis, yet there are a fair number in which the medical man finds it not at all an easy matter to decide whether the case in question is one of follicular tonsillitis or diphtheria, and there can hardly be a more important point at issue.

After the discovery of the bacillus of diphtheria by Klebs and Loeffler, and the corroboration of their researches by other observers, it was suggested that a very considerable aid to diagnosis might be found in bacteriological cultures obtained from the deposits found in patient's throat. A large number of investigations have since been made, and the general consensus of opinion seems to be that an important help to diagnosis in doubtful cases of throat disease is thus afforded, although many difficulties stand in the way, and the procedure can only be carried out in hospitals or laboratories provided with apparatus for bacteriological research.

But few cases have, as far as I am aware, been published in this country, and, therefore, I venture to bring before this Society the results which I have obtained, and I take this opportunity for thanking the members of the Middlesex Hospital medical staff for their kindness in allowing me to obtain the required material from their patients.

I must also ask the Society to accept this short paper merely as a preliminary communication, for I hope to conduct another series of cases upon a rather different plan.

In the series which I bring to your notice this evening I have relied entirely on the morphological characters of the Klebs-Loeffler bacillus, and I may quote as corroborators of this method many observers, such as Drs. Councilman and Williams, of New York ('American Journal of Medical Sciences,' November, 1893).

Some German authorities, however, have published cases in which they state that bacilli, indistinguishable by the microscope

from the bacillus of diphtheria, have been found in cases which were decidedly not of diphtheritic nature. These organisms, however, could be distinguished by means of further cultures on gelatine. Further investigations are therefore necessary before the matter can be taken as settled, but meanwhile, in accordance with the views of observers already mentioned, I would put on record the cases I have already examined.

These amount to 26 cases of diphtheria and 16 of follicular tonsillitis, in all of which latter there was a whitish deposit on the tonsils; but the whole history and clinical course of the cases left no doubt as to their nature.

The first to draw attention to the possible value of bacteriological cultures in the diagnosis of doubtful cases of diphtheria was Baginsky ('Berl. klin. Wochenschr.,' Nos. 9, 10, 1892), in 1892, and to his results I shall again refer.

The method which I have adopted is as follows:—

As soon after the admission of the patient as possible I endeavoured to detach a small piece of the deposit on the throat by means of a strong piece of platinum wire fixed in a glass rod, and bent into a loop at the end. This could easily be sterilised by heat. A piece of the deposit thus obtained was drawn over the surface of four or five culture tubes, containing glycerine agar-agar. The diphtheria bacillus grows well on this medium, and I always kept cultures of pure growth of the organism for the sake of comparison, inoculating fresh tubes as required. The tubes were then placed in an incubator maintained at a temperature of 37° C., and examined after 24 hours. A growth of some kind was always obtained, but by the naked eye it was not possible to tell with any certainty the nature of the colonies which developed. As a rule, those composed of the pathogenic bacilli were more opaque and rather more raised from the surface than those of the other organisms.

When some of the colonies were removed to cover glasses and stained, there was no difficulty in recognising the diphtheria bacillus.

For the benefit of those who are not familiar with the appearance of this microbe, I may say that the diphtheria bacilli are straight or curved, generally the former. They vary considerably in length, being on an average a little shorter than the bacilli of tubercle, but twice as thick. They often adhere to each other so

as to form chains, but the appearance which characterises them is the polymorphism of the rods. In some, one or both poles of the bacilli are stained deeper than the centre, so that in the latter case a dumb-bell form is produced. Occasionally they are fusiform in shape, whilst at other times some of the members may closely simulate diplococci.

In my series of cultures the question which naturally arises is whether other organisms occurring in throat affections may be mistaken for the bacilli of diphtheria.

I examined 16 cases of follicular tonsillitis in the manner described above, and in no one instance could I find any organism which so closely resembled the diphtheria germ that any mistake could arise. In fact, in 15 cases I found staphylococci or streptococci only, the former greatly preponderating, and in one case I found the bacterium termo, which from its size is easily distinguished.

Dr. W. S. Miller, in his work on the micro-organisms of the human mouth, states that he has isolated more than 100 different kinds of bacteria from the juices and deposits of the mouth, but the greater number of these were from tooth pulp and dental deposits. He does not draw any special attention to those which may be found in tonsillar deposits, but in the drawings which he gives of the various bacilli isolated, there are none which could be mistaken for the diphtheria bacillus with the use of a little caution.

I examined 26 cases of diphtheria. With the exception of two these were undoubted cases of the disease; the exceptions I shall again refer to.

In 15 cases diphtheria bacilli were demonstrated. In five of them the culture was almost pure, and in the remainder the bacilli were mixed with staphylococci. In the cases in which I failed to find the pathogenic organism, in eight staphylococci only were present, and in three streptococci.

With regard to this latter point, Baginski came to the conclusion that two organisms might cause diphtheria: the more serious forms being produced by the Klebs-Loeffler bacillus, and the less severe cases, in which recovery took place, by streptococci.

One of my three cases was that of a boy aged 6, who was admitted under the care of Dr. Coupland, who presented no membrane on the tonsils or pharynx, but there being much dyspnœa, tracheotomy

was performed and the boy recovered. Membrane was frequently coughed up through the tube.

The second case was that of a little girl aged 3, who was admitted also under the care of Dr. Coupland, with an illness of one week's duration, and suffering from urgent dyspnœa. The fauces were congested, but no membrane could be seen. Tracheotomy was performed, but death occurred six days subsequently. At the autopsy membrane was found on the pharynx, extending down the larynx trachea into the lungs.

The third case was that of a man aged 24, who was under the care of Dr. Cayley, and who exhibited firmly adherent whitish membrane over the tonsils and palate. This rapidly separated, and the man recovered.

In regard to the other eight cases in which diphtheria bacilli were not found, five recovered, three died. In two of the cases it was perfectly obvious why failure resulted: in one the membrane had been placed for a short time in 1 in 20 carbolic acid, and in the other the membrane had lain in water for some hours.

In another case, under the care of Dr. Fowler, the membrane was extremely thick, and the germs had probably been destroyed by its excessive growth. In two cases the patients were aged 1 and 2 years respectively, and owing to their struggles only mucus and no actual membrane could be obtained. In the three remaining cases I also failed to detach portions of membrane, and only succeeded in obtaining particles of mucus. These facts are interesting as tending to show that the mucus expectorated by diphtheric patients is probably not infectious, whilst the membrane is exceedingly so.

Turning now to the 15 cases in which bacilli were found. Of these 9 recovered and 6 died. I have little to say about them, except to refer to the two cases which were admitted with a diagnosis of tonsillitis.

One was that of a man aged 30, a police constable. He stated he had only been ill one day, suffering from headache and sore throat. Both tonsils were greatly enlarged. On the right was a large irregular ulcer, its base being formed by a grey slough. There were three other smaller ulcers on the right and two on the left tonsil, but no definite membrane was visible. The temperature was 99·2°. There was no albumen in the urine; the glands behind the angles of the jaw were not enlarged. Although

this was thought to be a case of tonsillitis a cultivation was obtained by removing a portion of the slough from the right tonsil, and an almost pure culture of the diphtheria bacillus was obtained, thus clinching the diagnosis.

The second was that of a woman aged 35. She had an attack of diphtheria in 1882. She had been complaining of sore throat for two days previous to admission. The uvula and both tonsils were very red and swollen, and on the right was a small white patch with a greyish-green centre. The glands behind the angle of the jaw were not enlarged, and there was no albumen in the urine. The diagnosis was, therefore, doubtful, but bacteriological examination at once cleared it up, as pathogenic bacilli were found in the cultures.

In reference to cases of membraneous laryngitis after the specific fevers, I have had no personal experience, but judging from recorded cases in which this method of diagnosis has been employed, promises to be of great value.

The cases I have examined are too few in number to found any definite conclusion upon, but I would venture to offer the following suggestions.

Firstly.—That bacteriological examination of material obtained from the throat in doubtful cases of diphtheria may prove of great service in diagnosis.

Secondly.—That on microscopical examination there is no great danger of mistaking organisms found in cases of follicular tonsillitis from the pathogenic organism of diphtheria, although the naked eye appearances of the cultures are not characteristic.

Thirdly.—That as certain observers have described non-malignant organisms similar to the diphtheria bacillus, if there be any doubt as to the nature of the bacilli, plate cultures on gelatine should be made as control experiments.

The PRESIDENT complimented the author upon his very valuable paper, and pointed out that researches having for object to facilitate the diagnosis of difficult cases were of great value in view of the importance of such diagnosis, in the event of the occurrence of suspicious cases in schools, &c.

Dr. ROUTH suggested that if the author would carry his researches somewhat further, according to the Pasteurian method, it might be possible to discover the means of conferring immunity against this malady.

Dr. WETHERED, in reply, admitted that researches in this direction would be very valuable, and promised that, if time allowed and circumstances permitted, he would do his best in that direction.

DIET IN BRIGHT'S DISEASE.

By Charles Henry Ralfe, M.D., F.R.C.P.

Last year, in a paper read before this Society, I pointed out that of late years the prognosis of many forms of Bright's disease had become more hopeful, partly owing to improved methods of diagnosis and its earlier recognition, but chiefly to the improved hygienic and dietetic management of the disease. With regard to this latter, I observed that it had assumed the form of what may be termed the "milk cure," *i.e.*, that is feeding the patient absolutely on milk, or if this is not entirely possible, with the addition only of the slightest modicum of some non-nitrogenous food. This exclusive diet has been generally adopted by the profession, and employed somewhat indiscriminately in all stages and forms of the disease. This I referred to in my paper, and I then expressed my opinion that a close analysis of cases would show that whilst an exclusive milk diet might be highly serviceable in some forms and stages of nephritis, it might even prove less effectual or even injurious in others. Since then I notice the subject has been taken up by others, who have somewhat more emphatically condemned the so-called "milk cure," and have claimed, at least for chronic albuminurics, a more liberal dietary. Such a decided swing back of the pendulum cannot pass without rigid criticism, since probably between the two extremes we shall discover a *viâ media*.

Among the earlier writers on Bright's disease, a simple, non-stimulating diet was advocated. Thus Prout, whilst observing that in acute cases the diet should be light and moderate, insists that in chronic cases this must be still more rigidly attended to, and advises that the patient should confine himself to mutton, poultry and the lighter kinds of fish, farinaceous substances, and vegetables. This form of diet was the one usually adopted till about 1876, when Dr. Donkin, of Durham, brought into notice the use of "skim milk" in the treatment of diabetes, and which he also advocated for the treatment of albuminuria. Although Dr. Donkin deserves great credit for introducing "skim milk" to the medical diet table, he failed, however, to establish "milk" treatment for albuminuria on a firm basis as a recognised method of treatment.

Partly because the facts he brought forward were not considered sufficient, and certainly as far as diabetes was concerned, as Dr. Pavy showed, not correct; since the milk treatment was proved in many cases to increase the excretion of sugar. Still, however, it attracted notice to the use of milk in albuminuria, which in time bore fruit, for in 1882 Dr. George Johnson read a paper in which he quoted instances of patients who had recovered from attacks of nephritis, even of prolonged duration, after the continuous use of an exclusive milk diet. From this time the profession "took on" to the "milk cure," and, as I have already said, have used it indiscriminately in all forms and stages of the disease. This tendency to push the milk diet did not, however, pass without criticism. Thus Dr. Saundby has expressed himself that milk in this disease is unnecessary, distasteful, and even harmful. And as far back as 1886 I endeavoured to discriminate the cases in which I found the exclusive use of milk beneficial from those in which it obviously failed.

In entering into a consideration of the proper form of diet required in any individual form of Bright's disease, we have to observe the stage on which it has entered, whether acute, subacute; whether caused by long standing venous congestion following obstruction of return of blood to the heart; or to active hyperæmia with hypertrophy of the left ventricle and tense vessels; or whether in this latter condition the stage of cardiac failure has been reached, and the vessels rigid and degenerated. We have also to take into consideration the complications which are most urgent, whether in the form of uræmia, dropsy, or hæmorrhage. And, finally, the etiological factors that are present, whether idiopathic or constitutional.

Our means of judging of our success in adopting any particular plan of diet in an individual case can be gauged (*a*) by its influence on general nutrition, (*b*) on the cardio-vascular system, as shown by the character of the pulse, and effect on the secretion of urine. Some of which results I have ventured to place before you this evening.

To take cases of acute nephritis first:—

Case 1.—I have here a table giving the weekly daily average of a patient, placed the first week on a mixed ordinary diet, then for three weeks on an exclusive milk diet, whilst on the fifth week he resumed the mixed diet. The results were that the quantity of urine was nearly doubled, the solids in the urine raised from 34 grammes to over 50 grammes; the urea increased by nearly one-third, and the albumen de-

creased from 3·38 grammes to 0·85 gramme during the period the patient was on milk. On resuming a mixed diet the quantity of urine fell nearly one-half. The solids were decreased, as well as the urea ; whilst the albumen rose from 0·85 to 1·18 grammes. The milk diet was again resumed, and continued till the urine became free from albumen, and the patient was discharged.

Case 2.—This table represents the case of a man admitted with acute nephritis, hæmaturia, and dropsy. The results show on milk diet an increase in the quantity of urine of nearly one-third, solids, an increase from 38 grammes to 50 grammes, urea, an increase from 28 grammes to about 40 grammes, and albumen a decrease from 2·48 to 0·62 grammes during the three weeks on milk diet. Whilst on resuming a mixed diet (with 4 ounces of meat daily), the quantity of urine fell by one-third, the solids were decreased as well as the urea, whilst the albumen was only slightly decreased. On resuming the milk diet the previous conditions were restored, and eventually the patient left the hospital free from dropsy, and with only occasional traces of albumen in the urine.

The results obtained in these two cases have been observed in other cases of acute nephritis, and in many in which the disease was of recent origin the urine became perfectly normal, and remained so for a considerable time after. As a rule the milk diet in these cases is well tolerated. With some it causes sickness, which can be generally met by resorting to skim milk, either entirely or in part. Or the same purpose can be obtained by giving the milk with some effervescing water. Some complain of disturbance of the heart's action after taking milk for some time, this may be due to the excess of potash salts in that fluid. It often causes constipation and griping pain in the abdomen, this generally yields to small doses of sulphate of magnesia taken with the milk. One patient, who persevered two years with this diet, used to remark that, when he ventured to thicken his milk with arrowroot, this addition was followed by vascular excitement, as if he had taken alcohol, with a decided increase in the amount of albumen.

The next class of cases are those of chronic nephritis, such as eventuate in granular kidney.

Case 3.—In Case 3 the patient was suffering from heart disease. The effect of the first week on milk diet showed comparatively little change from the preceding week on mixed diet, but the second week shows the influence of digitalis which had been inadvertently prescribed two days in the week, in the increase of the urinary water, solids, and urea and albumen ; but the interesting point is the comparison of the weekly average of the last week, when mixed diet was resumed, with the first week of milk diet, in the fall in the amount of solids and urea.

Case 4.—Is one of chronic nephritis, with marked cardio-vascular action, hypertrophied left ventricle, and tense pulse. The interesting point

here is the sudden fall both in the amount of solids and urea after the first week on milk, accompanied by an uræmic convulsion. On this account the milk had to be stopped, but, on cautiously resuming it, no great differences were to be noted, except the steady decline of the amount of albumen. Nor after resuming middle diet was there anything particular to be noted, except a slight increase of solids and urea.

Case 5.—Was one of granular kidney, in which the heart, previously hypertrophied, had undergone degeneration and dilatation, whilst the vessels were hard and rigid; there was also some dropsy. The chief feature in this case was a slight diminution of solids during the three weeks the patient was on milk diet, and of urea. Whilst on resuming a mixed diet there was a rebound. The albumen showed but little variation.

Case 6.—In a patient suffering from chronic nephritis, complicated with waxy degeneration, the effect of the milk diet was to decrease both the solids and urea, both of which again increased when middle diet was resumed. The albumen increased on the milk diet, and still more so when the mixed diet was resumed. This patient bore the milk treatment badly, and could only stand two weeks instead of the three weeks, as in the other observations.

To sum up the general results, it may be said that the effect of a milk diet in Bright's disease is in *acute* cases to increase the quantity of urine, the amount of solids, the urea, and to diminish the quantity of albumen; all which is reversed when a more stimulating diet is resumed. In the *chronic* cases, however, the effect on the urinary water is not so marked; but, on the other hand, both the solids and urea are decidedly lessened. The amount of albumen was certainly lessened by the milk diet, as in Case 4, in which a strongly acting left ventricle and tense pulse was noted. Whilst in Case 5, with a failing heart and rigid vessels, very little change occurred; and in Case 6 the albumen actually increased under the milk diet, though whether this increase was not due to the progress of the disease may be questioned, since the increase continued after the resumption of middle diet.

An exclusive milk diet was certainly badly borne by the chronic cases, they speedily tired of it, became feeble and languid, uræmic tendencies increased; but, on the other hand, a notable diminution of the frequency and tension of the pulse took place. This alteration in the force of the circulation no doubt explains the diminution of the urinary solids and increase of uræmic symptoms of these patients. For with the resumption of a more stimulating diet they disappear as the tension of the pulse rises, they also then experience a sense of well-being quite distinct from their previous *malaise*. In seeking an explanation for the different actions of a

milk diet in acute cases as compared with chronic ones, the following facts should be borne in mind. That in acute cases the tissues of the body are presumably healthy, at all events have not been long clogged with excretory products, and the process of metabolism goes on fairly well, whilst cardiac vascular changes are not advanced. Uræmia and dropsy, when they occur, are caused rather by the local obstruction in the kidneys than by failure of the circulation, or by defective action of metabolism in the tissues. In chronic nephritis the reverse obtains, and we find that so long as the circulation maintains its vigour, uræmia seldom occurs. The reduction of vigour caused by a milk diet, in producing an uræmic convulsion, is well illustrated by Case 4.

But whilst we recognise the fact that a milk diet increases the tendency towards uræmia, we must not ignore the value it possesses in reducing the tension of pulse, in cases in which we have a strongly acting left ventricle, high tension, and atheromatous arteries, patients in whom a full diet would probably very shortly induce cerebral hæmorrhage. The effect of a meat diet to increase tension of the pulse is so well known that I need not enter into details; but I will content myself by mentioning two cases in which the resumption of animal diet was evidently the cause of fatal cerebral hæmorrhage. The first was brought under my notice by Dr. Skyrme, who, with Mr. Kelson, as house physicians, have aided me in this enquiry. This was a patient, about 50 years of age, with rigid vessels and tense pulse, who after being on milk diet wearied of it to such an extent that she was placed on fish; not content with this, she requested to be allowed meat, and was allowed a small chop a day. The next day she expressed herself feeling very much better, but Dr. Skyrme noticed a great increase of the pulse tension; the day after fatal cerebral hæmorrhage occurred. The second instance was a patient I saw in town, a gentleman aged 48, with advanced renal disease and a pulse of very high tension. He was ordered a milk diet, but as he soon tired of it he was allowed some other light food in addition. I placed him under the care of Dr. Embleton, of Bournemouth, who found him very intractable in the matter of diet. On three occasions on which I was summoned down to Bournemouth to see him, hæmorrhage had followed his taking a more stimulating food than that ordered for him. Did time permit, I might add to these other instances of cerebral hæmorrhage following on the resump-

tion of a comparatively full diet after a non-stimulating one; also of cases of tense pulse with headache and giddiness which had been materially relieved by a change from the ordinary diet to food of a farinaceous kind with fish and milk. But this latter point has been confirmed by other observers, and requires no further reference to-night.

One other objection to the employment of a full diet in these cases of chronic nephritis lies in the well-known fact that cerebral hæmorrhage occurs so frequently after a meal, and, viewing the rise of tension that occurs almost immediately after the ingestion of food, I have for some years past considered *quantity* of food taken of as much, if not greater, importance as the *quality*.

In dealing therefore with the question of diet in chronic Bright's disease, we are brought face to face with two dangers of an opposite character—the one from *uræmia*, the result of too low a diet; the other from hæmorrhage, the consequence of too stimulating a one.

Fortunately, between milk on one hand and meat on the other, we have a number of intermediary articles of food, such as fish, poultry, game, green vegetables, fruit, and farinaceous materials which, judiciously employed, can be arranged so as to form a dietary not too stimulating, especially when administered in only small quantities at a time.*

To sum up, the result of these observations seems to point to the conclusion that—

(*a.*) In *acute nephritis* an absolute milk diet is followed by beneficial results, and may even lead to the patient's recovery if persevered with. Its effect on the urine being to increase the elimination of the solid matters and of urea, and to decrease the amount of albumen.

(*b.*) Whilst in *chronic nephritis* we find a milk diet usually followed by a decrease in the urinary solids and of urea, and consequently an increased tendency to uræmic troubles; on the other hand, anything approaching a *full* or too stimulating a diet increases the tension of the pulse, which adds to the risk to be apprehended from cerebral hæmorrhage.

* I would here like to remark that my observations confirm those made years ago by Dr. Prout, that sugar does not usually suit chronic albuminurics; on the other hand they are able to take fatty matters well.

In these cases when the tension is high, a milk diet may be useful for a time to reduce the vascular action, but its effect should be carefully watched. Should a more stimulating diet be required, as in cases with a failing heart and degenerated vessels; then here, again, great circumspection must be used in the choice of articles, their effect on the pulse closely estimated, and only small quantities given at a time.

Dr. Hale White said he did not rise to criticise the author's conclusions, seeing that for the most part he agreed with them. The subject was one in which he had taken the greatest interest, and he had carried out a series of analyses of the urine in 10 cases comprising several hundred separate analyses. To the results of these analyses were added full notes of the condition of the pulse under the different diets. His patients were all suffering from chronic Bright's disease, so that he had nothing to add to the author's observations on the acute cases. He agreed that in these the milk diet was desirable. His results in the chronic cases had been very much the same as those arrived at by the author. In the majority of the cases a milk diet led to a slight increase in the amount of urine excreted, and a consequent diminution in the specific gravity. Strange to say, however, the amount of albumen in many of his patients under the milk diet was greater than it was under a more highly nitrogenous diet. This fact, however, was not so surprising as it seemed at first sight, if one considered the action of the nitrogenous diet on the circulation. His being all hospital cases, the circulation was at a low ebb. He urged that too much stress was laid upon the amount of albumen in chronic Bright's disease. A little consideration would convince them of the error of so doing. Half the people who had albumen in their urine were not suffering from Bright's disease at all; they might have cystitis, or heart disease, or a febrile attack, or a thousand and one other things apart from Bright's disease. For this reason albuminuria *per se* was not a very serious disorder. Moreover, the amount of albumen which a patient suffering from chronic Bright's disease lost, a few grammes a day, was an infinitesimal loss so far as the whole body was concerned. Although, therefore, it was interesting to know that a full diet actually diminished the amount of albumen, he did not think they were entitled to lay too much stress on that fact, because the amount of albumen *per se* was not of any serious import. He had arrived at the conclusion that the milk diet tended to increase the tendency to uræmia when this was threatening. In none of his patients could any increased tendency to uræmia be detected after the administration of a meat diet. One case in particular was a striking proof in the opposite direction. He was, when looking after this patient, a believer in the advantages of a strict milk diet in patients threatening uræmia. During the whole of an attack, therefore, this particular patient was kept on a rigid milk diet. In spite of this she rallied, and, as soon as the symptoms abated somewhat, she was placed on a meat diet, whereupon the symptoms cleared up altogether and never returned. The next point was as to the general condition of the patient, and that, he had assured himself, was often definitely improved by ordinary diet. Such patients got weaker on a milk diet, and many of them got to loathe the milk. Under a meat diet the patients' spirits

rose, and the circulation was restored to its original vigour. For all these reasons it appeared highly desirable not, by any means, to lay down any strict rule in favour of a milk diet in chronic Bright's disease. If they were called upon to adopt some routine practice without consulting individual requirements, and, if patients had to be treated each and all on some settled plan, he thought it would be better not to make that rule an exclusively milk diet.

Dr. Solomon Smith asked whether any record had been kept of the condition of the digestive organs in these cases. He pointed out that in some instances, in which a milk diet failed to produce its usual beneficial effects, this might be due simply to the fact that the milk was not digested. Milk was valuable both as a food and as a diuretic, and when under its use one found a patient doing ill, with lessened excretion of urea, lowered pulse tension, and general failure, it was well to inquire whether or no the milk was being digested. Some people found it extremely difficult to assimilate milk, and to such a diet exclusively composed of it might be only a form of starvation.

Dr. Shuttleworth asked what was meant exactly by a milk diet, whether the milk was cooked, which he believed was generally the case in the London hospitals. They used to put epileptics at the Royal Albert Asylum on a milk diet, and it was remarked that boiled milk was often not tolerated, or, if so, only for a short time. It was best borne when given without boiling, or in the form of milk porridge and the like. He asked whether any difference had been noted in the effects in albuminuria of the milk of other animals than the cow, asses' milk, for instance; also whether the substitutes for milk, such as Nestlé's condensed milk and others, produced the same effects as ordinary cows' milk. He understood, from certain competent authorities, that artificial foods prepared from milk did not produce the same effects on the blood as fresh milk, and he referred to the observations of Dr. Barlow and others on the production of scurvy rickets as a result of their use for feeding infants.

Dr. Kelson said the cases were all treated in a routine way by the milk diet. Dr. Ralfe had on one occasion ordered a quantity of eggs to be added, rather in deference to the opinion of others, and the results had been most disastrous—in fact two of the patients died in such a way as almost to justify the inference that it was due to the eggs. In one case there was immediate anasarca, and in the other cerebral hæmorrhage. The cases were at once put back on a milk diet, when the untoward symptoms passed off, except in the two cases which he had mentioned.

Dr. Wethered pointed out that there must be a great difference in the reaction of patients to such a change of diet, according as they were in hospital or private practice. The reaction in the case of patients accustomed to good living was naturally much more pronounced than in the case of hospital patients. He asked, therefore, whether the same amount of benefit had been observed in hospital, as in private, patients.

Dr. Ralfe, in reply, said he had anticipated some criticism in respect of his remarks anent the condition of the pulse. Many of them must have found, as he had found, that an exclusive milk diet could not be persisted in, because some of the patients did badly under it, especially when uræmia was threatening. He objected, however, to Dr. Hale White's use of the term "full diet," which he thought was liable to give rise to a very false impression, an impression which he was sure was not that which Dr. White had intended to convey.

Dr. Hale White observed that by a full diet he meant a hospital full

diet. The term was a technical expression, and the hospital full diet only comprised meat once a day, and only one allowance of that.

Dr. Ralfe, continuing: It was well to make this point clear. He warned them against allowing the pendulum to swing round too far in the other direction, and it ought to be made clear that what was required was only the addition of some solid nitrogenous substance to the diet, in fact, a more solid but not a more stimulating diet. Milk reduced the tension of the pulse very considerably. He mentioned that at one time he had given sugar in large doses to albuminuric patients, but he had come to the same conclusion that Dr. Prout arrived at 40 years before, viz., that sugar in large quantities was not tolerated by such patients. The drain of water was not wanted, and the only effect was to weaken the patients. The ordinary milk diet consisted of 4 pints of milk taken with or without some effervescing water. If it caused much constipation, skimmed milk was given, not that there was any virtue in skimmed milk as such, but the fat having been removed, the milk was more easily digested. The proportion of urea in the urine was estimated daily by the bromide process, and this was corrected once a week by Liebig's process. He pointed out in respect of the estimation of the precipitate of albumen that the height of the precipitate varied according to the time it was left standing, the height being greater after 12 hours than after 24. Unless an allowance were made for this fact, the results would of course be conflicting. Moreover, the deposit might contain many things other than precipitated albumen: epithelium from the tubules and from the urinary tract, urates, &c., all of which add to the apparent quantity of albumen. It was, therefore, necessary to filter the urine before boiling, in order to eliminate these sources of error. What he did was to take a sample of the urine for 24 hours, then filter. He then took 20 c.c. of the urine and slightly aciduated with dilute acetic acid, and again filtered. It was then boiled and filtered on a weighed paper, the filter-paper being placed on one side for a week to dry, and again weighed. The difference in weight would then give the absolute amount of albumen. This he observed was the only means of arriving at an accurate estimate of the amount of albumen passed during the 24 hours.

The President asked what amount of milk was allowed.

Dr. Ralfe said that 4 pints was about the quantity, but more was given if asked for. The patients were allowed to take it as they pleased, raw or boiled, and there was no limit as to quantity.

April 2nd, 1894.

A CASE IN WHICH ABDOMINAL SECTION FOR OBSTRUCTION OF INTESTINE BY BAND WAS TWICE SUCCESSFULLY PERFORMED.

By H. P. Dean, M.S., and J. Hutchinson, jun., F.R.C.S.

The chief interest of this case lies in the fact that the same patient twice underwent the operation for acute intestinal obstruc-

tion by a band, and recovered quickly on each occasion. The interval between the two operations was about 10 months.

The portion of gut strangulated was on each occasion the small intestine.

The patient is now in good health.

C. N., a man aged 20, was admitted under the care of Dr. Sansom into the London Hospital on December 23, 1892. The diagnosis of acute intestinal obstruction was made, and the patient was, within a few hours of his admission, transferred to the surgical side of the hospital, and came under my care.

The history obtained from the patient was that, until December 19 (*i.e.*, four days previous to his admission), he was in good health. On the evening of that day he suddenly felt pain in the abdomen, chiefly in the region of the umbilicus. This was soon followed by vomiting, which continued until he was admitted, and was not fæcal. The pain came on in paroxysms, and during these attacks the intestines could be easily seen and felt to contract. There was no abdominal tenderness and no tenesmus. The bowels had not been opened since the onset of the pain, and the patient thought that they had not been opened for some days previous to the attack. On the day of admission he was given an enema, which brought away a small stool. On his admission to the surgical ward it was decided to operate at once.

The patient was anæsthetised by chloroform, and an incision 3 inches long was made in the middle line just below the umbilicus.

On opening the peritoneal cavity a quantity of blood-stained fluid and some coils of intestine, much distended and intensely red, escaped through the wound.

On putting the hand into the abdomen a tight band could be felt attached to a coil of intestine, and while examining this it suddenly broke away from its attachment at the other end, leaving a band about $1\frac{1}{2}$ inch long attached to the coil of intestine. A careful search was made to see the exact site of the attachment, but without success. As the band gave way a coil of intestine presented, showing the mark caused by the constricting structure. The intestine below this mark was quite collapsed and fairly normal in appearance. The band was then carefully dissected from the intestine and removed from the body. The peritoneal cavity was sponged dry, and the edges of the wound brought together by silkworm gut stitches passed through the whole thickness of the abdominal wall.

Two days after the operation the patient developed a small patch of pleurisy, which quite disappeared in three days. The patient progressed well, and was discharged on January 15, 1893, exactly 21 days after the operation.

The band was about the thickness of the ulnar artery in the dead body, and on microscopic examination was found to consist solely of fibrous tissue.

The patient, a young clerk, had been operated on by my colleague, Mr. H. P. Dean, 10 months previously, for acute intestinal obstruction. He remained well until the morning of September 11, 1893, when at daybreak he was seized with acute abdominal pain and sickness. He came up to the hospital, was treated with medicine without relief, and in the evening was admitted into the medical wards. I saw him at 9 P.M., when

he was writhing with pain, which came on in spasmodic attacks. He had kept nothing down since the morning. The obstructed coil of intestine could be readily felt through the abdominal wall on the left side of the middle line. The diagnosis rested between a volvulus and strangulation by band, and as the latter was most probable, and the seat of obstruction certainly in the small intestine, I decided at once to open the abdomen without trying large enemata and massage, &c. As the linea alba was occupied by the scar of the former operation, a fresh incision was made in the left linea semilunaris. It was fortunate that this course was adopted, as there were extensive adhesions of small intestine to the scar, and even with great care it would have been almost impossible to prevent opening the gut had the wound been made in the linea alba. The strangulated loop was 8 inches in length, greatly distended, and purple in colour, constricted by a narrow cord-like band, which was connected with the intestine that was adherent to the linea alba. The adhesions were cautiously divided with blunt-pointed scissors, and it was only then that the constricting band could be thoroughly exposed and cut through. It was remarkable how suddenly the congested intestine returned almost to its normal colour. It had been necessary to divide the left rectus completely across, and the two ends were united with boiled silk and catgut sutures. Before this was done, however, the peritoneum was brought together by a continuous suture over the raw surface so as to lessen the risk of recurrence of the adhesions. The peritoneal cavity was cleansed ; no difficulty was found in returning the intestine and sewing up the wound, owing to the operation having been done within 20 hours of the onset of obstruction and there being but little general distension.

The whole operation (under ether) took about an hour, and the patient was not collapsed at the end of it. An injection of morphia (one-sixth of a grain) was administered, and to relieve his thirst iced soda-water and teaspoonful doses of milk and soda-water. At the end of 36 hours he began taking Valentine's meat-juice with milk, and small doses of whiskey, &c.

The only complication to note was slight sickness during the first two days. An evacuation was obtained on the third day by means of an enema. The wound, dressed with double cyanide gauze, healed by first intention. He left the hospital at the end of three weeks, and I have repeatedly seen him since. There has been no tendency to ventral hernia at the site of operation, although the rectus was divided ; and he is now in capital health.

It can be but very rarely that a patient undergoes two operations for acute intestinal obstruction, and the fact that in this case recovery from both was as rapid as could be desired makes it worthy of record, if only as an encouragement to early operative interference. It must be admitted that the results of this course in acute obstruction by bands, volvulus, Meckel's diverticulum, &c., do not appear to improve as fast as was expected. The hope was that, as soon as it became recognised that every hour's delay in resort to operation in cases of fairly clear diagnosis was not to be justified, our statistics would greatly improve. And yet, although these cases are now readily transferred by the physician to

the surgeon, and the opportunity frequently afforded of abdominal section within 24 hours from the onset of symptoms, it would seem that the recoveries are disappointingly few in proportion to the total number of operations. It would be easy to compile most favourable statistics from the cases published from time to time in the medical journals, &c.; but this would be a useless task, since, with few exceptions, only the recoveries are published. A table published by Farquhar Curtis in the 'Annals of Surgery,' 1888, p. 329, appears to be the least open to reproach on the score of incompleteness. Curtis gives a percentage of recovery after abdominal section in 328 cases of acute obstruction of 31 per cent. (102 recoveries, 226 deaths). Of 97 cases due to bands or diverticula, recovery followed operation in 41 per cent. A Russian surgeon (Obalinski, of Cracow) has recorded* the results of 38 abdominal sections for acute intestinal obstruction performed by himself with an almost identical proportion of recoveries (16 as compared with 22 deaths).

It can hardly be doubted that early operation is the right course in these cases of acute obstruction by bands, &c., and whilst the results at present may be admitted to leave much to be desired, yet they should only encourage us to fresh efforts at improvement.

Certain points arising from the case now recorded may briefly be noticed.

1. As regards the diagnosis, this was very clear at the time I saw the patient. The sudden onset and severity of the symptoms, the intense pain referred mainly to the region of a single distended coil of small intestine which could be readily felt, and the history of a previous operation for a similar attack—all these features of the case indicated strongly that the cause lay in a constricting band.

2. I do not believe that the manipulations included under the term of abdominal massage, free enemata, &c., would have been of the slightest avail. The band was tough and cord-like, it could have been ruptured only with considerable force, the strangulation was so severe that it seemed impossible at the operation that the constricted loop could have been made to unravel itself.

3. The case strongly points to the advisability of operating as soon as the diagnosis is fairly settled. The constricted small

* 'Archiv. für klin. Chirurgie,' 1888, vol. xxxviii, p. 249.

intestine was greatly distended and deep purple in colour, although only some 15 hours had elapsed from the onset of symptoms. As already noted, when the band had been divided the congestion was rapidly relieved. A few hours more and it might have been impossible for the gut to recover its contractile power.

4. One point of much interest arises in connection with the firm adhesions of non-obstructed intestine to the line of the former operation. In order to free these one rectus was divided transversely, and it was found that the constricting band was closely connected with these old adhesions. Whether the subsequent suture of the edges of the parietal peritoneum together will prevent further adhesions occurring is uncertain, but the importance in all abdominal sections of a separate union of the peritoneum cannot be doubted. Some authorities advise that the closure of the wound should be effected by three sets of sutures, one including peritoneum only, the second the muscular wall, the third the skin and subcutaneous tissue. It is quicker, and probably quite as good a method, to first sew up the peritoneum carefully by a continuous catgut suture, and then with interrupted silk or silkworm gut sutures to secure the remaining external tissues. I had occasion lately to observe the result of this method in a case of ventral hernia in which death occurred from other causes within a fortnight of the operation. The line of sutured peritoneum could hardly be distinguished, its edges being perfectly smooth, and the suture having been almost entirely absorbed.

There is no question that this slight detail in the technique of abdominal section, whilst it requires a little extra care and time, tends to prevent accidents in passing those sutures which traverse the muscles and still more ulterior bad effects from intestinal adhesions.

ACUTE INTESTINAL OBSTRUCTION BY A BAND. OPERATION; RECOVERY.

By W. Pasteur, M.D., and J. Bland Sutton, F.R.C.S.

Annie M., the subject of this communication, is a married woman aged 23. She comes of a sound stock, and has always enjoyed good health. Her first confinement took place five years

ago, and was normal in every respect. Her present illness dates from her second confinement on June 26, 1893. Nothing unusual occurred at the time, and she was up and about on the 14th day. She caught cold whilst being "churched" shortly after, and felt "pains all over" for two days. With this exception, she continued well for another fortnight, but was then suddenly seized with acute abdominal pain and vomiting. She took to her bed, and was visited by the obstetric house physician from the Middlesex Hospital, who found acute tenderness on vaginal examination, but no swelling or fixation of the pelvic viscera. She was treated for peri-metritis, and in the course of a week was sufficiently recovered to go to Southsea for change of air.

During the fortnight she remained at the seaside, she was frequently troubled by distressing pain in the lower abdomen, which she attributed to flatulence, and took little heed of.

On the day following her return to town (September 6) the abdominal pain became much aggravated, and the belly began to swell, and became so tender that she could not fasten or bear the weight of her clothes. She again took to her bed, and was treated at home until the day of her admission to the Middlesex Hospital on September 27. The practitioner in attendance had diagnosed inflammation of the womb, and of the left lung. She had vomited on one or two occasions, and had been delirious at night.

She was admitted to hospital at 1 P.M., and I saw her at 3 o'clock, when her condition was as follows:—

Dorsal decubitus; knees and hips flexed; face pale and anxious; features pinched, with sweating forehead: intellect clear. Abdomen much distended, and acutely tender all over; visible transverse coils of small intestine. Breathing almost entirely thoracic; occasional hiccough; liver dulness normal. Vomited at 4 P.M. about 2 ounces of brownish liquid with a strong fæcal odour. Pulse rapid, regular, small, and of low tension. There had then been total obstruction for four days. Hot flannels were ordered to be applied to the abdomen, and $\frac{1}{4}$ grain morphine injected under the skin.

At 5 P.M. Mr. Bland Sutton saw the patient with me, and an exploratory laparotomy was decided on. At 5.45 P.M. the stomach was thoroughly washed out with warm water. About $\frac{1}{2}$ pint of feculent liquid was removed, and 1 ounce of brandy was then given through the stomach tube.

The patient expressed herself as being much more comfortable

after this, and certainly her aspect had improved, and the pulse was better in quality. At 7.30 P.M. a brandy and beef-tea enema was administered, and at 8 P.M. Mr. Sutton operated.

I quote from the notes of Mr. Berkeley, the house surgeon:—

"An incision 3 inches long was made in the middle line, below the umbilicus. As soon as the peritoneum was opened, distended gut at once presented in the opening. The peritoneum was not shiny, and some flakes of recent lymph were visible."

In the very centre of the wound a loop of intestine was observed, surrounded, but not constricted, by an inflammatory band. The band was ligatured in two places, and cut through. Immediately beneath this some collapsed gut came into view, and on slightly raising a distended coil a tightly constricting band was exposed to view. This was similarly ligatured and cut, and immediately the contents of the distended gut were seen to flow freely into the collapsed portion of intestine. No other bands could be discovered. The patient was now in a very collapsed state, and, after injecting some brandy into the rectum, the wound was closed and dressed. The patient was not moved from the operating table, owing to her alarming state of collapse. Hot applications, stimulant injections, and other restoratives were freely resorted to, but it was not deemed advisable to remove her to bed for an hour and a half. She vomited a small porringerful of fæcal smelling liquid half an hour after the operation. Nutrient enemas, and brandy and warm water were given at intervals through the night.

September 28.—Had a fair amount of sleep after a morphine injection at 1 A.M. Urine was passed involuntarily during sleep, also large quantities of flatus, and some very offensive liquid fæces.

During the next 48 hours she made good progress, but the flatulence was rather distressing, and there was profuse sweating during sleep.

On October 1, the fourth day after the operation, the temperature suddenly rose from 98° to 104·4°, and signs of pneumonia appeared over the upper part of the right lower lobe. On the following day there was greenish muco-purulent expectoration, which looked slightly bile-stained, and there was shortly after slight general jaundice, which passed off in the course of a few days. The pneumonia involved the whole of the right lower lobe, and simultaneously extended over the greater part of the left base.

The signs of consolidation over both lungs were unequivocal, and cough and expectoration were a source of much discomfort to the patient.

The temperature was unusually remittent in type, and there were frequent profuse and exhausting sweats. The temperature fell by crisis on the ninth day of the pneumonia (October 10).

During the progress of the pneumonia, the condition of the patient gave rise to much anxiety, but she began to mend rapidly after the crisis. She was allowed to get up on October 25.

From the 2nd to the 7th of November her condition became less satisfactory. She was troubled with sickness and abdominal pain and tenderness, with constipation. There was a slight rise of temperature, but no distension. These symptoms yielded readily to treatment by simple enemas, restriction of diet, and occasional injections of morphine. They were sufficiently accounted for by the reappearance of the catamenia, and the patient's indulgence, without permission, in apples and currant cake.

She was discharged cured on November 17, and reported herself in perfect health a few weeks since.

Although until quite lately the opinion has generally prevailed that of all the forms of intestinal obstruction that due to bands is the most fatal, the records of the past few months contain several instances of successful surgical interference in such cases.

We believe that success in the present instance was, in a large measure, due to the early stage of obstruction at which the operation was performed, and to the unusually accessible situation of the obstructing band. It is significant that in spite of these exceptionally favourable circumstances the operation threw our patient into a state of dangerous collapse.

As regards the possible relation of the pneumonia to the abdominal trouble, we are unable to offer any opinion. It seems to us, however, that its sudden onset and termination by crisis on the ninth day is opposed to the hypothesis of a causal relationship between the two conditions.

Mr. Lockwood observed that Mr. Hutchinson had laid considerable stress on the manner in which the abdominal wound had been closed, and he evidently attached very great importance to its being sutured layer by layer. He himself had performed a large number of abdominal sections of various kinds, and he sometimes adopted one method and sometimes the other. He could not be sure that in the linea alba any particular value was to be attached to the treble layer of sutures, nor had he been con-

fronted with any of the disadvantages which Mr. Hutchinson seemed to anticipate from the enclosure of the peritoneum in sutures which also comprised the muscles, &c., of the abdominal wall. He had, he admitted, always taken great pains to include a very little of peritoneum in the sutures in bringing it together along with the other structures, and to see that it was exceedingly smooth before the sutures were drawn tight. In other regions than the linea alba, however, considerable advantage might, he conceded, attend the employment of the method of separate suture, in the loin for instance, or in the linea semilunaris. After incision in either of these regions, he had always found it advisable to close the peritoneum first, because the peritoneum tended to fall away from the wound, and the muscles stood a better chance of giving way if they were not securely fixed by deep and buried sutures. As Mr. Hutchinson had laid so much stress on this point, it would be interesting to know what the authors of the other paper had to say thereon. He gathered that they had employed an ordinary series of sutures, and the advantage of this procedure in that particular case was fully exemplified, seeing the condition of the patient. It would undoubtedly have added considerably to the risks of the operation if the already profoundly collapsed condition of the patient had been added to by the necessity of prolonging the operation, in order to insert a treble row of sutures. It was in such cases as these that one was glad to be able to employ a single row of sutures. Nothing was better than fishing-gut for the sutures in these cases, the sutures being placed together, not more than one-half or one-third of an inch apart, and including very little of the peritoneum, very little of the skin, but a good piece of the muscles. He insisted on the fact that surgeons were often not careful enough to take in the fibrous structures which went to form the abdominal wall. He thought that the linea alba was after all the most convenient incision for an exploratory operation, though there were very good reasons for making the second incision in Mr. Hutchinson's case elsewhere. This point merited special attention, because at that Society and elsewhere it had lately been the fashion in doubtful cases of acute intestinal obstruction to advocate an incision over the region of the cæcum, on the ground that many of the causes of acute intestinal obstruction were met with in that situation, and that the operator was enabled, if no obvious cause could be found for the obstruction, to get at the large intestine which was not distended, or the small intestine which was. He could not help thinking that success in these cases was dependent upon (1) the operation being undertaken early, while peristalsis was still active, and before intestinal paralysis had been caused; and (2) on operative interference not being delayed until the intestines had become distended. He himself always despaired when he was called in to operate in cases in which the intestines were distended. If it were possible to compare the results of operative interference in cases of acute obstruction with distended abdomen and those in which distension was not present, he believed a very great difference would be found to exist in the mortality of the two groups of cases. In Dr. Pasteur's case the fact that the patient on the very night after the operation passed flatus pointed to probable recovery. He had never, after operation, seen an abdominal case go wrong in which flatus had been passed. He agreed with Dr. Hutchinson that, in his case, abdominal massage would not have done much good. Judging from what he had heard—for he had never seen it tried—he thought that there was probably less risk in a properly conducted abdominal section than with the so-called abdominal massage.

Mr. Stephen Paget asked what were the advantages claimed for fishing-gut over silk for sutures. Personally he preferred the latter. He referred to a case of strangulation which had come under his care a few days before, in which the history was much less acute, the symptoms of strangulation having lasted at least a week. He found that the gut, though constricted, was not tightly strangulated, the condition not approaching gangrene. This he hoped would explain why the symptoms varied so much in different cases, and why the symptoms were not always a guide to the real condition of the patient. He insisted on the importance of getting as clear and precise a history from the patient as possible. Some months before he had had an opportunity of watching hour by hour a case of acute enteritis with intestinal distension and fæcal vomiting and absolute obstruction. The patient was so ill that death appeared to be imminent ; yet, in a day or so, the obstruction passed away, the distension ceased, and the patient made a rapid recovery. He contrasted this case with a case of constriction by a band which came under his notice shortly after. The only clue due to the diagnosis was the history previous to the attack. In the enteritis case the patient was exposed to cold and fatigue in a journey from the south of France ; the bowels had been disturbed, and this was followed by an outbreak of violent inflammation. In the other case the man was suddenly taken ill on a Monday, after a Sunday passed quietly, without fatigue and without exposure. His diet was simple, and the bowels had acted regularly every day. This made the case look like one of mechanical obstruction, and, on operating, he found the seat of the obstruction to be in the right iliac fossa, in the shape of a band, which he divided, and the patient did well. The case was unusual, in view of the great length of time that had elapsed before the bowels acted of themselves. There was no flatus for a week, nor any motion until the tenth day, and then only after an enema. The patient took nourishment remarkably well per rectum, 4 ounces being administered every three or four hours, until he was able to take nourishment by the mouth.

Mr. Clinton Dent observed that success in these cases was largely dependent on factors many of which were still imperfectly understood. Early operation was doubtless very important, but it was not all. He contrasted the results of operation for ordinary strangulated hernia at present and many years ago, and observed that the results now obtained were scarcely better than formerly. In respect, however, of these abdominal cases of acute obstruction by bands, there could be no question that the results were vastly better than was the case in days gone bye. He repeated that there was a great lack of knowledge in respect of the differential diagnosis of these cases. Even in the five instances brought before them that evening, the same uncertainty of diagnosis had been alluded to. Possibly by-and-bye they would be enabled to distinguish clearly between the various conditions. He concurred in the importance to be attached to obtaining a clear and precise history from the patient. On the history reliance might usually be placed, all the acute symptoms having developed within a few hours or days, were not likely to have been forgotten by the patient, who, at most, might exaggerate particular events. He insisted on the importance of rapidity of operation. Whatever was done should be done quickly ; and they could not too closely approximate the line which separated speed from haste. The less complicated the sutures the better ; again, the undue multiplication of sutures was to be avoided, or any procedure which involved expenditure of time. In flushing the

abdomen with hot fluid they had a sure means of combating collapse. They ought certainly to avoid parts where they might expect to meet with adhesions. Occasionally he thought it was preferable to suture the peritoneum separately. A common after complication in these cases was intestinal distension, causing dragging on the sutures, and probably some suppuration. With the sutures through the peritoneum he thought there was less risk. The cases brought before them that evening were all successful, and that was matter for congratulation. Still he regretted that more of the unsuccessful cases were not published, for in that way knowledge would be better advanced. The unsuccessful cases were usually those that remained longest in our own memories, though no doubt the successful cases were those that people hoped would remain longest in the memories of others. Hospital records, if carefully searched, would reveal failures enough, but such cases would be of great value. He challenged the assertion that the passage of flatus was necessarily a sign of good augury; he knew of a case in which a double band was revealed only *post mortem*. This patient had passed flatus almost from the onset of the symptoms down to his death.

Mr. Lockwood explained that he preferred fish-gut sutures, because they were much more easy to introduce, and therefore took less time, and also because, bulk for bulk, they were much stronger. Moreover, there might be septic fluid in the abdominal cavity or outside, and fishing-gut had much less capillarity than silk. He had remarked that since they used fishing-gut there was much less inflammation around the sutures, and still less stitch-hole suppuration.

Dr. Jennings said that the only case of the kind in which he had operated was also a successful one. It too was an exploratory operation. He had broken down numerous bands of adhesions, chiefly affecting the large intestine, but others were found binding down the small intestine, and were therefore also divided. Before closing the abdomen he had thoroughly explored both the large and small intestine from the stomach to the rectum. All the symptoms passed off, and it looked as if the patient were going to have an uninterrupted recovery. Ten days later, however, urgent symptoms returned, but feeling convinced him that he had divided every band that had existed, Dr. Jennings came to the conclusion that others must have formed in the region of the transverse or descending colon, so he performed right lumbar colotomy in preference to attempting re-division of the bands or adhesions, and then the patient recovered.

Dr. Pasteur called the attention of the speakers to the supervention of the pulmonary trouble in his case, and asked for some remarks on this head.

Mr. Bland Sutton observed that the patient looked so bad, that he asked himself seriously the question whether he would be justified in operating, but Dr. Pasteur had pressed him to give the patient this last chance. He agreed that the whole subject of acute intestinal obstruction was enveloped in much obscurity. They were quite in the dark as to why these patients died so quickly and in such a way, and the nature of the poison to which they succumbed was still a mystery. That was a question which must be left for the students of physiological chemistry to elucidate. He thought it was really curious that there should still be such differences of opinion as to the best site for the incision, and the manner in which it should be closed up. When exploring the abdomen in an obscure case of intestinal obstruction, he always made a vertical

incision between the pubes and the umbilicus in the linea alba, because the intestines lay below a horizontal line drawn midway between the umbilicus and the ensiform cartilage. The surgeon could very well reach the cæcum or the sigmoid flexure, or even the pelvis, with the finger through such an incision. Then in respect of the method of suture. He pointed out that formerly it was held to be indispensable to cut through the layers of the abdominal walls, layer by layer, on a director. That had been abandoned in favour of a shorter plan, and now, some surgeons having gained this time at the beginning of the operation, proposed to fritter it away by insisting on suturing the wound layer by layer. The secret of success in these cases was dexterity of operation, with a minimum of manipulation of the intestine, and the greatest speed possible consistent with care. He himself always comprised the whole of the structures in his sutures, and he had never seen any harm result therefrom. The object of the multiple suturing was to avoid ventral hernia, but he pointed out that whatever precautions they might take, ventral hernia would occur in a certain proportion of the cases. It might be one, two, three, 10, or even 16 years, but form they sometimes would. All statistics of cases published within a year or two of the operation were useless from this point of view. When a surgeon invented a new suture or a new dressing, he always pointed to the primary union of the wound as evidence of the efficacy of his contrivance, but, as a matter of fact, in no place on the body except, perhaps, the face, was primary union more readily obtained than in wounds of the abdominal parietes. He believed that excessive manipulation of the intestines was largely responsible for the shock which was so often associated with these operations. In his own case he had noticed that shock came on as soon as he explored the neighbouring intestine with the finger. He felt it incumbent upon him to make this exploration, because he had on two occasions seen *post mortem* that surgeons having relieved one constriction had left another, which caused the patient's death. He laid down three rules for these operations : (1) to operate as quickly as was compatible with safety ; (2) not to operate at all unless the case was in an early stage ; and (3) to be very gentle and tender in manipulating the intestine, handling it, indeed, as if it were of the most fragile glass.

Mr. Hutchinson, jun., in reply, adhered to the view that great importance was to be attached to sewing the peritoneum first, especially in cases of ovariotomy, &c., in which speed was not of great moment. In this respect he presumed other speakers would agree with him. He did not necessarily advocate suture layer by layer, only insisting on the necessity of suturing the peritoneum separately. This method did not take much longer, whilst it saved the surgeon from certain risks of accident. He referred to a case in which a portion of gut had become constricted between loops of simple interrupted suture. Moreover, if they had to remove one or two of the sutures, shortly after the operation, the intestine might tend to prolapse into the wound. That would be avoided if the peritoneum were sutured first. Then, too, there was certainly less risk of subsequent ventral hernia, and there must be less risk of the formation of such adhesions, as was exemplified in his case. Mr. Dean had used an interrupted suture, but several coils of intestine had become adherent to the scar, and this was obviously what might happen in any case. Mr. Mayo Robson had recently brought forward several interesting examples of troublesome symptoms from what he considered to be simple adhesions of the intestine to the abdominal wall, and this reinforced the

lesson. He agreed that early intervention, though not, unfortunately, a guarantee of success, was of great importance. He referred to a case under his care of strangulation of small intestine in a young man, by Meckel's diverticulum. The symptoms had lasted four days, and the gut was extremely congested. This patient was completely relieved of his pain after the operation, and he quite hoped that he was going to recover. For five days he did well, but on the sixth or seventh day there were bad symptoms, and he died of gradual inflammation of the loop of intestine, which had not recovered its contractility, and had become distended and inflamed in consequence. Had the case been operated on earlier, this complication would not have presented itself. He commented on the fact that nothing had been said during the discussion in reference to the practice that had been advocated last year of making an artificial opening into the gut, as well as relieving the obstruction. All the cases mentioned that evening were in favour of what might be termed the ideal operation, that is, simple division of the band without making any artificial anus. He added that though he had seen one or two cases treated by his father by massage, &c., with success, in which there were unequivocal signs of acute intestinal obstruction, in no case operated on by himself had he seen reason to regret the prompt resort to abdominal section, nor did he believe that any one of them could have been relieved by massage, &c., alone. He thought that they themselves would prefer under similar circumstances to pass forthwith into the hands of a surgeon who was not unwilling to operate. The operation in his case took about 50 minutes, and, but for the time taken in separating the adhesions, it might have been completed within half an hour. He had collected all the cases of the kind at the London Hospital during the last ten years, and he hoped to publish them as soon as he had obtained the necessary permission from his colleagues. Such statistics would be of considerable value, but that could not be the case in respect of statistics compiled from cases published in the medical journals. It did not appear that cases of strangulated hernia came nowadays under operation much earlier than they did 30 years ago; at any rate the average duration of strangulation in 100 cases operated on at the London Hospital (1885 to 1889) was three days, just about the same as in a series of cases collected by Mr. Hutchinson, sen., about 1860.

April 30th, 1894.

AN INSTRUMENT FOR USE AFTER INGUINAL COLOTOMY.

By J. Macready, F.R.C.S.

This instrument has been designed to assist during the sad remainder of life those unfortunate persons who have undergone inguinal colotomy. It was invented by a gentleman under the

care of Dr. Charles Savory, upon whom I performed this operation for cancer of the rectum. The patient was at first supplied with a truss of that particular pattern which is so well adapted for interstitial hernia, but he soon discovered that something more than a truss was needed, and, after making many imperfect specimens, at length succeeded in completing the instrument which I will proceed to explain.

But before so doing, it may be well to enumerate the several objects which an instrument for inguinal colotomy is expected to fulfil. In the first place it should be of a moderate size, so that it does not show through the clothing. Secondly, it should sit close to the body, and not be liable to displacement. Thirdly, it should present a surface to the artificial anus of such a form, and should exert such an amount of pressure as will prevent the exit of solid fæces and prolapse of the bowel. Fourthly, it must make provision for the escape of discharges. In some cases of cancer of the rectum it happens that the discharges from the diseased surface do not escape, or do not wholly escape, by the anus, but regurgitate and flow away from the lower opening of the artificial anus. If these discharges are prevented by a solid truss from coming out, the patient is apt to suffer much discomfort, which sometimes becomes quite intolerable. Lastly, the instrument should allow the patient to empty the bowel when the motions are fluid, without obliging him to quit the society of friends or to interrupt the course of business. No truss pressure will keep in fluid, and unless this occurrence be provided for, he cannot enter the presence of other people without being haunted by painful apprehensions.

This instrument, which is seen in position on the body in Fig. 1, is of moderate size, and consists of two principal parts, a plate of xylonite, which rests against the false anus, and a reservoir formed by an india-rubber bag. The plate of xylonite is seen in position in Fig. 2 after the rubber bag has been detached. In Fig. 3 the instrument is turned with its abdominal side looking towards the spectator.

The plate has a somewhat rhomboidal figure, and is kept in position by an elastic belt, or, better still, by a truss spring embracing the pelvis. The attachment is made at the two lesser angles of the rhomboid, and, though I am not a good enough mathematician to know the true explanation of this device, the practical

Fig 1.

Fig 2.

Danielsson & Co, sculp

Fig. 3

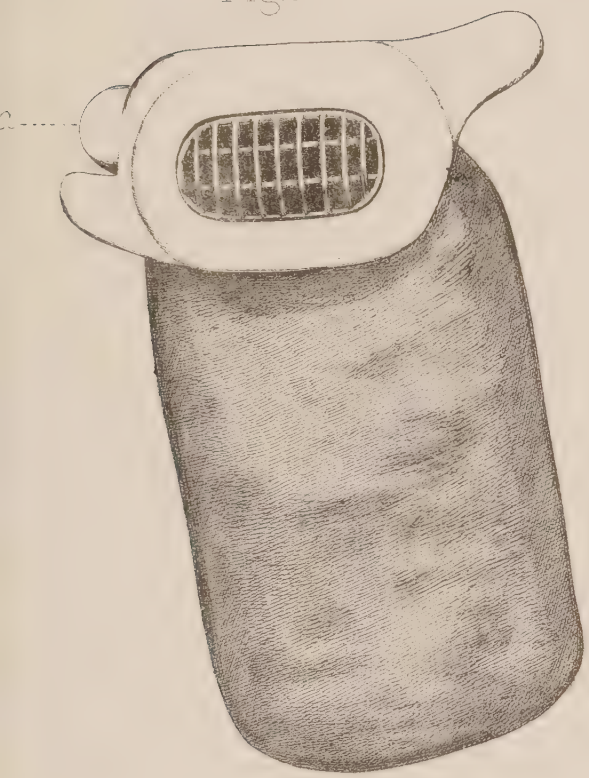


Fig. 5.

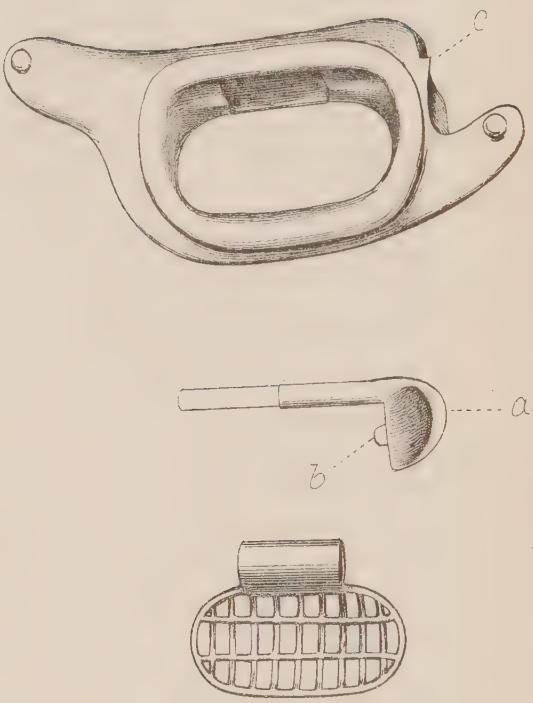
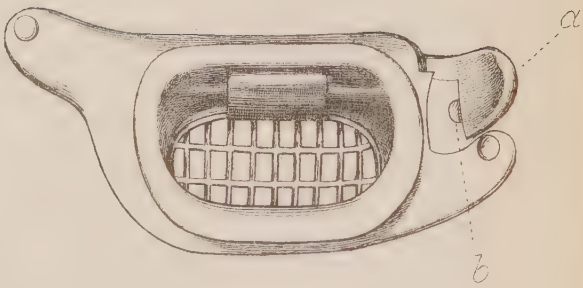


Fig. 4.

Fig. 6.



Danielsson & Co. sculp

effect is to give the instrument when applied to the curved surface of the belly a remarkable degree of stability. If the patient is to make active exertion, it is well to add an understrap to be fixed at the lower and inner angle of the instrument.

The surface of the instrument that looks towards the abdomen is seen in Fig. 3. The central part is pierced by an oval opening, which permits the false anus to communicate with the reservoir. This latter consists of an elastic bag, with an orifice at the upper part, where it is attached at the outer aspect of the instrument. For convenience in cleaning, it is necessary that the bag should be so fixed that it can be rapidly detached and easily readjusted. This is accomplished by surrounding the aperture in the plate with a projecting recurved lip, over which the edge of the opening in the elastic bag is readily fitted.

The opening in the plate on the abdominal side forms the boundary of the false anus, and allows the bowel to communicate with the exterior. This opening is filled up by a grating of thick gilded wire (Fig. 3), which is slightly convex towards the belly, and fits accurately the aperture in the plate so as to be upon the same plane with, and to form part of, its abdominal surface. The object of the grating is sufficiently obvious, for when it is fixed, as it can be, in a manner to be presently described, it prevents prolapse of the bowel and the passage of solid fæces, but its meshes are not so close as to impede the escape of discharges, which flow up to the false anus and pass into the bag.

All the conditions set forth at the outset as requisite in this instrument have now been fulfilled, except that one by which the patient is enabled to relieve the bowel in case of diarrhœa or of a sudden gush of loose fæces. He can do this by means of a device which permits him to open the grating and turn it outwards and upwards (Fig. 4). The grating hangs from a bar (Fig. 5.*a*) which passes through the upper part of the plate just above the opening. The bar, where it rests in the hinge of the grating, is three-sided, so that if the bar revolves the grating moves with it. The bar terminates at the left side of the instrument in a little excavated handle (Fig. 6.*a*), and it is that there may be no impediment in reaching and working this handle from the trouser's pocket that the attachment of the belt or truss spring is made at the lesser and lower angle of the rhomboid. But I have already pointed out that this arrangement also subserves another purpose.

At the lower part of the handle of the bar is a little projection (Fig. 5.*b*, Fig. 6.*b*), and when the bar is pushed in as far as it will go when the grating is filling the aperture in the plate (as in Fig. 3), this projection fits into a small recess (not seen in any of the figures), and serves to fix the bar and the grating depending from it. When the bar is drawn out for a short distance (Fig. 6) the projection is disengaged from the recess, and the bar can be made to turn, carrying the grating upwards (Fig. 4), and thus enabling the bowel to communicate freely with the bag. The grating, when wide open, can be fixed in that position by pushing the bar home again, whereby the projection is supported upon a ledge (Fig. 5.*c*). When the stool is concluded, the grating can be closed again by making reverse movements of the bar.

If the patient is not very dexterous at first in managing the apparatus, and happens to pull out the bar too far, it is of no consequence. The grating falls into the elastic bag, and the bar can be dropped into the pocket as the hand leaves the trouser, or may be carried to the waistcoat pocket without exciting suspicion.

The instrument is made by Mr. Gustav Ernst, and can be obtained either fixed to a truss spring or provided with an elastic belt.

OPERATION FOR RUPTURE OF THE INTESTINE WITHOUT EXTERNAL WOUND.

By William Henry Battle, F.R.C.S. Eng.

Few cases that are brought under the notice of the surgeon cause him greater anxiety than severe injuries of the abdomen, and I think that there are none which call for the exercise of the highest powers of diagnosis and treatment more than those which belong to the class to which I wish to draw attention. It is not claimed that this case presents anything new in the way of treatment; still, as the damage was more extensive than is recorded in any cases that have been submitted to operation up to the present, it is possible that some useful lesson may be learned from its consideration. At all events, it gives us the chance of appreciating the advances which have been made since Mr. Croft demonstrated to the profession that traumatic rupture of the intestine without external wound could be cured by the surgeon.

A stableman, aged 24, was admitted to St. Thomas's Hospital on August 10, 1892, suffering from the effects of a kick in the abdomen by one of the horses in the yard in which he worked. The injury occurred about a quarter past two in the afternoon, and the patient was carried to the hospital, where he was received in a very collapsed condition. He had not vomited. The patient was a fair man of slight build, suffering markedly from shock, with anxious, white face, and a small and feeble pulse. He complained much of pain in the abdomen. Below the umbilicus, extending more to the left than to the right of the middle line, was a bruise, not particularly defined, but in the situation where the hoof of the horse had struck him. The abdomen was extremely hard to the touch, somewhat distended, and did not move with respiration. Dulness was found on percussion over the front of the abdomen. A catheter was passed, and about half a pint of clear urine drawn off; it escaped with a fair amount of force. Soon after admission to the ward he commenced to vomit, bringing up entirely undigested food. When I saw him about 3 P.M. he was still suffering much from shock, being cold and shivering, with anxious face; he lay on his right side with limbs and body flexed, and vomited from time to time. He complained much of pain in the abdomen, which was excessively hard and fixed, like a board, and very tender. Light percussion showed that there was dulness over the anterior part of the abdomen, that this dulness was increasing (the house surgeon, Mr. Milton, had noticed it on admission, when it was less extensive), but that it did not extend into the left flank, nor was it evident in the epigastric region.

From the symptoms described above (especially the condition of the abdomen, the pain, and the frequent vomiting) and the history of the accident, the opinion formed was that the man had sustained intra-peritoneal rupture of the intestine, and rupture of the mesentery or omentum. As the shock was pronounced, it was decided to wait before operation in order to give him time to rally, and as the diagnosis was made a subcutaneous injection of morphia was administered to relieve the pain. At 8 P.M. he was placed under ether, and a median incision was made, commencing just below the umbilicus. Slight extravasation of blood was present in part of the incision, and the peritoneum bulged forward when reached, looking black in colour, and when it was incised a gush of blood followed. The patient was straining at this moment, and a coil of intestine was forced out. A rent was found in the mesentery of this coil, which was bleeding freely; the hæmorrhage was being arrested with clamp forceps when the open end of a piece of intestine sprang into the wound. The other end was found by tracing the mesentery along. This portion of mesentery was much contused and lacerated, and it was found that when fully exposed the damaged portion extended nearly to its parietal attachment, spreading outwards in a fan-like manner beyond a second complete rupture, about 8 inches from the first. The intestine was as completely divided in both places as with a knife, the mucous membrane protruding and curling over the other coats. Only a small amount of intestinal contents had escaped, amongst which were one or two partly-digested beans. Slight hæmorrhage was going on from the mesenteric lacerations; the intestine was contused, and in one or two places the peritoneal surface was somewhat torn. It was evident that the contusion and laceration of the mesentery would result in gangrene of the bowel if the latter were left, and that it would be difficult, if not impossible, to arrest the hæmorrhage from the lacerations without removing the bowel.

So I decided to resect the bowel with the damaged mesentery. The bowel was divided beyond the rupture on each side, and a large wedge-shaped piece of mesentery removed with it. The bowel removed measured nearly 13 inches, and the section was made where the gut appeared to be undamaged and its mesentery without laceration. Great care was taken to secure bleeding points, which were numerous. The edges of the incision in the mesentery were sewn up with a continuous suture, and as it was agreed to employ lateral anastomosis at this part, the ends of the intestine were turned in and the peritoneal coats brought together by means of a continuous suture inserted after Lembert's method. At this stage in the operation Mr. Milton assisted in suturing the mesentery whilst I was suturing the bowel, thinking that we had probably found the extent of the damage, when another rupture was discovered about a foot beyond. This rupture, which was as cleanly made as the others, did not quite surround the bowel, none of the coats being ruptured for about a quarter of an inch on each side at the mesenteric attachment. Bleeding points having been secured, these two ends were brought together end to end by means of Senn's plates, cut to the required size, and a ring of Lembert's sutures used to further strengthen the union. Neither of these ends were resected, they did not appear bruised, and the mesentery was intact. Returning to the resected closed ends, which had been left for a time, an incision was made into each as nearly as possible opposite the insertion of the mesentery, about $2\frac{1}{2}$ inches from the end; a Senn's plate was passed into each of these openings, the two parts were brought into apposition, and additional sutures placed around after Lembert's method, in order to give greater security. No other injury having been found, the intestine was returned, though with some difficulty, on account of the rigidity of the abdominal walls. The abdomen was then washed out with boracic acid solution, a Keith's drainage-tube was passed into the pelvis, and the remainder of the incision closed with deep silk sutures. During the operation, which was necessarily a prolonged one, lasting more than two hours, the patient suffered severely from increased shock, and five pints of saline solution were injected into the left median basilic vein. This had an immediately good effect on the pulse, which was maintained throughout the rest of the operation.

During the after-treatment of the case the chief complaint was of thirst; this was excessive and could hardly be assuaged. Small quantities of warm water were frequently given, but relief was only partial; ice, which was tried later, gave him more relief.

The operation was performed on the 10th, and he had no sickness until the morning of the 12th, when he vomited frequently small quantities of bile-stained fluid without any effort. On the 13th the vomiting occurred at intervals of from half to three-quarters of an hour, about an ounce at a time, of yellowish-brown, acid-smelling fluid; in the evening, as the vomiting continued, a simple enema was given, and the bowels acted freely. Afterwards he vomited about three-quarters of a pint of fluid, the pulse increased in frequency, and he complained of some pain in the abdomen; but this passed off in an hour, and he slept comfortably through the night. No return of the vomiting took place until 6.45 P.M. of the 15th.

The morning after the operation it was noted that the abdomen was softer and moved slightly with respiration. About 2 ounces of blood-stained fluid were removed with a pipette. In the evening only 2 drams of fluid were removed, and Keith's tube was taken out; a suture which

had been left in position was tied, thus closing the abdominal wound. On the 14th the abdomen was flaccid and moved well with respiration. The patient was at this time doing very well; he had no pain, his tongue was clean and moist, he had recovered from the shock, and he spoke cheerfully and with a strong voice. The only evidence of anything being amiss was the temperature, which was always 100° or above in the evening, and never quite normal in the morning. Nothing but warm water, and later ice, was given by the mouth, the patient being fed with nutrient enemata until the 14th, when the administration of milk was commenced, 1 dram every half-hour. Next day, the 15th, some meat essence was also allowed, but in small quantities. Until 6.45 P.M. of the 15th everything appeared to be satisfactory, with the exception of the temperature; at that hour he vomited, complained of severe pain in the abdomen, and passed into a state of collapse, with local signs of peritonitis. The temperature rose to 101°. It was evident that perforation had occurred. As soon as possible after my arrival at the hospital the patient was placed under ether and the abdominal wound opened up and extended. A coil of intestine presented; this was found to be the part of the intestine which had been placed in lateral anastomosis. The appearance was that of normal gut, but on handling a hole was found through which some of the contents escaped. This was evidently a suture hole torn by the manipulation, there being no lymph or evident ulceration. Three Lembert's sutures were inserted. More to the left of the abdomen, the other point of suture was found; several stitches had given here, union between the ends had broken down, some of the contents of the bowel had passed through, and the coils of intestine near were covered with flaky lymph. In the condition of the patient it was not possible to resect the bowel and perform enterorrhaphy, so an artificial anus was formed as quickly as possible, and the open ends were secured to an opening in the linea semilunaris. The median incision was closed. He died at 4.30 A.M. on the 16th, not having rallied from the operation.

Necropsy.—There was no evidence *post mortem* of injury to the abdominal wall beyond that resulting from the incisions. There were old and firm adhesions between the diaphragm, the liver, and spleen, also between the parietal peritoneum and the omentum. The right pleura was firmly adherent all over, and there were some firm adhesions of the left pleura. There was recent peritonitis, most intense below the left costal cartilages. The first rupture of the bowel had occurred 20 inches from the pylorus; this was the part fixed to the abdominal wall. The ends of the part which was united by lateral anastomosis were softened and congested, the mucous membrane beginning to slough. The plates had disappeared. Recent hæmorrhages were present in the lower lobes of the lungs; hæmorrhage had been extensive in the left lung.

Remarks.—I was most favourably situated in this case for the carrying out of the necessary treatment. The patient was admitted soon after the injury, and I saw him not long afterwards, being able to make a diagnosis, and to prepare for what proved to be a most formidable operation when he had somewhat recovered from the shock. The history of injury—the kick of a horse—was very definite, and that is one of the most common causes of subcutaneous rupture of the intestine. The symptoms commenced

immediately after the injury, and indicated severe damage to the abdomen; there was intense pain, rather of a paroxysmal character, accompanied by vomiting, well-marked shock, and great anxiety of mind. The hardness of the abdomen was remarkable; the walls appeared immovably fixed, and respiration was entirely thoracic. The only local evidence of the kick was the slight bruising alluded to, and this would have been overlooked without careful search. The slightness of the discoloration has been frequently noted in similar cases, and I should not allude to it here, only it is of some importance from a medico-legal view; only a year or two ago a man who had kicked another in the abdomen with fatal effect was acquitted by the jury because *they* did not think that so severe an injury as rupture of the bowel could have been caused, as was proved to have been the case, without more external signs of damage. It was considered that the dulness on percussion in this case indicated rupture of the omentum or mesentery, and that this dulness was caused by the blood effused. The amount of extravasation of contents of the bowel is not sufficient of itself to produce dulness in these cases, and, rupture of other viscera having been excluded, there is no other likely source but one of the structures named. In itself the presence of this fluid, if increasing in amount, is enough to justify exploration; for if it comes from a lacerated mesentery death may ensue in consequence of its quantity, or the interference with the blood-supply may lead to gangrene of bowel over a limited area at a later date. There are many cases which differ from the type represented in the history of this patient. In 1885* I showed a specimen of rupture of the intestine to the Pathological Society. The man, aged 21, was kicked by a horse in the left side of the abdomen at 5 P.M. the day before admission; he seemed unable to move for about a quarter of an hour, but then went on with his work till 6.30 P.M. On returning home he had food, but vomited it almost immediately, and was restless during the night; however, he went to work in the morning at 6 o'clock. After a slight breakfast he was unable to resume work, on account of pain in the abdomen and vomiting, and went home to bed, whence he was brought to hospital at 1.30 P.M., having been frequently sick and in a state of collapse. He died from acute septic peritonitis $27\frac{1}{2}$ hours after receipt of the injury. There was rupture of the small

* 'Transactions of the Pathological Society,' 1885, p. 211.

intestine, the opening measuring $1\frac{1}{4}$ inch in the long axis and $\frac{1}{2}$ inch transversely, with contusion and laceration of the bowel round it. Such cases are not common, but have been observed by others. It is probable that had this patient been admitted at first the true state of affairs would have been recognised in time to have permitted some effort at relief. A rise of temperature may be an important indication of the early onset of septic peritonitis, as in one of Mr. Croft's cases. This would have been overlooked had that case been at home, and the importance of the other symptoms under-estimated. It was once my duty to treat a man who was admitted with an inguinal hernia in which strangulation had ensued immediately after he had been knocked down and run over. He was much relieved by the operation for hernia, but became extremely restless, and died on the fifth day from peritonitis with albuminuria. After the "ether vomiting" he had no more sickness. At the *post-mortem* examination a rupture of the small intestine was discovered at $6\frac{1}{2}$ feet from the ileo-cæcal valve. It was in the long axis of the gut, and measured about $1\frac{1}{4}$ inch in length. The peritonitis was very intense. Operation must be regarded as the only chance of saving life, even if peritonitis has commenced; this complication is most serious, but patients have recovered. A remarkable case is recorded in which a patient with peritonitis due to injury was submitted to operation. A hernial sac when explored was found to contain a piece of potato. No opening in the bowel could be found, although such must have been present and of large size; yet the patient recovered. A second exploration, also through a median incision, gave a negative result. The best chance, however, is afforded by *early* operation; this is proved by recorded results. So far as I have been able to discover, there have been 15 operations for this injury since Mr. Croft read his last paper before the Clinical Society in March, 1890, including the case now brought forward. I have appended a list of them. My case survived for six days, but no less than seven have recovered completely; the others died—viz., peritonitis, &c., 4; exhaustion and congestion of lungs, 1; exhaustion, 1; shock, 1. This shows a great improvement as compared with the earlier series collected by Mr. Croft, for out of 14 then known only one was completely successful—a boy who was operated on by Mr. Croft—and one died a month after the first operation from exhaustion after operation for the closure of an artificial anus;

this patient was also under the care of that surgeon. By "operation" I would imply abdominal section and the union of the bowel after resection of the contused edges, not the formation in any case of an artificial anus; in this I am in accord with Mr. Croft. There are several reasons for this. 1. The rupture is generally found high up in the jejunum, most frequently in the first 3 feet—a bad position for artificial anus, from the difficulty met with in adequately feeding the patient. 2. The rapidity with which we can now bring together the divided ends by means of some mechanical contrivance such as Dr. Murphy's button. 3. The risks of a later operation for the closure of an opening of the bowel in a patient whose general condition is bad. The large area of mesentery which had been lacerated and contused in this case formed a most serious complication, for much time was required in excising it, owing to its extent, the free hæmorrhage from numerous large vessels, and the necessity for careful suturing afterwards. It is also possible that the extensive bruising of the mesentery may have had something to do with the failure of union from interference with the proper supply of blood to the parts. Luckily, this is not a frequent complication. Dr. Curtis estimates that it is only present in about 16 per cent. If a similar case came under my care I should resect edges although they looked healthy. It was chiefly the bad condition of the patient that made me trust to suture without resection. Another point which this case impressed on me is the advisability of making the abdominal incision at or above the umbilicus. It is difficult to adequately examine and manipulate the intestines if the incision is made below that point. I wish to thank Mr. W. F. Milton for his great assistance at the operation and care of the patient. Mr. F. C. Abbott and Mr. T. A. M. Forde also rendered much help during the operation.

Mr. Croft complimented the author upon his treatment of this case. He said that he knew of no department of surgery which called out the character of the surgeon so much as did this class of cases. In deciding upon his diagnosis and determining on carrying out what he considered best for the patient, without loss of time, the surgeon was severely tested. One of the most interesting points about these cases was the diagnosis. He said that in making out the list of cases to which the author had kindly referred, he himself had been struck by the loss of time which, either by accident or on purpose, had been allowed to elapse before an operation. In the case in which he had been successful, his success was probably due to the fact that on a particular morning, having

gone to the hospital about another case, the house surgeon had called his attention to a lad who had been admitted on the preceding evening. The patient had been kicked in the abdomen. There were no external lesions, but the lad was evidently very ill, and he decided at once to open the abdomen in order to ascertain the extent of the injury. This enabled him to deal with the injured intestine at once, and by good fortune, the case being in other respects favourable, a good recovery rapidly followed. Early intervention was evidently one of the elements of success in this class of cases. In the case to which they had just listened the operator was obviously at a disadvantage. The injury was unusually severe, and it was a very difficult and knotty point to have to decide whether to cut out the piece of bruised intestine or not. He thought that the author's determination in any future case to cut out the bruised edges of intestine was the correct one. The state of the mesentery also added to the difficulty of the situation. The extensive injuries to the mesentery probably accounted for the imperfect blood supply to the parts of the intestine operated upon, resulting in non-union of the parts brought together by sutures. It was, he said, most important to place the sutures in firm, healthy tissue. At the time of his own case in 1892, he had reviewed the symptoms upon which one could rely in determining to open the abdomen. He had gone over the symptoms most carefully, and had come to the conclusion that there was no one symptom upon which the surgeon could rely. They must consider the combination of symptoms as a whole, and then determine upon the best course to pursue. It would be much safer to open an abdomen and explore in such cases, even at the risk of not finding any serious lesion of the intestine. He concluded by congratulating the author upon the courage which he had shown in bringing forward such a case, regardless of its not having been successful, for by that means only could they hope to discover the most successful mode of treatment.

Mr. Herbert Allingham referred to the case of a child aged seven who had been run over by a cab. Very little could be seen on the abdominal wall, but the child was obviously ill, so he cut into the abdomen, and found that a foot of small intestine had been torn from the mesentery, and bleeding was going on. He secured the bleeding vessels, and sutured the intestine to the mesentery, but the child died in four days, and, *post mortem*, they found that the intestine corresponding to the part of the mesentery torn away was gangrenous.

Mr. Battle, in reply, said the operation lasted two hours, and the patient was extremely collapsed when the third rupture was discovered. Therefore, as the edges appeared to be free from any mark of contusion, he thought that by turning them in and using plates he might get firm union. He had, however, evidently miscalculated the vitality of the tissues, for that was the part that subsequently broke down. He had been led to do a partial operation in this third rupture because, in addition to the slight damage to the edges, that part of the mesentery which had not been torn through did not appear to have been injured. In future, however, he would certainly excise. He agreed, on looking through the recorded symptoms in the list of cases published, that no one symptom could safely be taken as a guide. The most important symptoms were severe paroxysmal pain in the abdomen with vomiting. Mr. Allingham's case did not come within the description of ruptured intestine, but his intervention undoubtedly tended to prolong life.

INTESTINAL OBSTRUCTION.

CÆCUM OPENED IN THE MIDDLE LINE OF ABDOMEN, FOUR MONTHS LATER STRICTURE OF DESCENDING COLON RESECTED.—THREE WEEKS LATER ARTIFICIAL ANUS DISSECTED OUT AND HOLE IN CÆCUM SUTURED AND RETURNED INTO THE BELLY.—DEATH TEN MONTHS LATER.

By Herbert W. Allingham, F.R.C.S.

William C——, aged 30, was admitted into the Great Northern Hospital, January 9, 1893. No family history of cancer or phthisis—never had typhoid or resided in any foreign parts. For the last two years had suffered from constipation, and about six months prior to this attack had had abdominal obstruction lasting for about a week, relieved by purgatives and enemata.

For the last ten days before admission he had not had an action of the bowels, and had been vomiting constantly the last two days. On admission the abdomen was greatly distended, tympanitic—no tumour to be felt; great pain at times—nothing had passed by the rectum even after repeated enemata, no rectal stricture. Aspect abdominal. Tongue moist but furred, and he stated he had not taken anything for the last few days. As he continued to get worse, abdomen more distended and vomiting incessantly, on January 11 he was taken into the operating theatre, the abdomen opened in the middle line below the umbilicus, the cæcum and small intestines were found to be enormously distended. The intestines were so stretched that I was afraid to very carefully explore the abdominal cavity for fear of bursting the guts. Accordingly, the cæcum was well drawn into the wound into the belly-wall, opened, and a quantity of fæcal matter came away. After it was emptied it rapidly refilled again and again. When more than two quarts of liquid fæces had escaped, the opening in the cæcum was closed with pressure forceps. The cæcum was then thoroughly washed and returned into the abdomen, and the part of the cæcum around the clip on the opening was carefully sutured to the edges of the abdominal wound about its lower part, the upper part of the belly wound being closed in the usual manner.

The patient passed a good night. The next day, as the cæcum

seemed well glued up to the belly-wall and the cavity thoroughly blocked off by lymph, the clip on the opening in the cæcum was removed, and the bowels from the opening acted quite freely, affording great relief. From this time the patient made an uninterrupted recovery, the bowels acting daily by the artificial anus, nothing whatever passing by the rectum. He returned to his home at Southampton, February 13. On May 29 he returned to the hospital greatly improved in health; he was fat and looking well. The bowels acted daily by the artificial anus, in fact the fæces were constantly running away, as is always the case when the cæcum is opened, on account of the liquid condition of the fæces at this part of the large intestine. He asked me if it was possible to cure him, and I, having carefully explained all the risks, he consented to undergo the operation.

On May 31 I made an incision 5 inches long along the left linea semilunaris, meaning to carefully hunt through the sigmoid flexure and all the colon to find the cause of the obstruction and remove it if possible. The abdomen being opened, as I have said, in the left semilunaris, I introduced my hand into the abdomen, and commenced by passing the sigmoid flexure through my fingers. This being normal, I continued my search up the descending colon, and about its centre found a hard, tight stricture. The gut above and below the stricture was secured by india-rubber tubes passed through the mesentery. A large piece of the gut and the stricture between the tubes (about 4 inches in length) was then excised. Several large mesenteric vessels were divided about the mesentery and were secured. The "V"-shaped section in the mesentery was then united. The proximal and distal openings in the gut were carefully joined over a Mayo Robson's bobbin, the mucous membrane of the intestines being first sutured together as described by Mayo Robson by silk sutures, and, lastly, the serous surfaces of the gut united with Lembert's sutures. The parts were then well cleaned and returned into the belly. The wound in the belly-wall united in the usual way. A little opium was given him after the operation. The patient passed a good night. The temperature the next day was 99·8°, and the patient vomited a little—abdomen not distended. The wound was dressed and covered with blue gauze and collodion, which kept it sealed from contamination with any fæcal matter which came from the artificial anus. I may here say the artificial anus was well plugged

with a sponge prior to the operation, and was only removed on June 2 (two days after the operation), and then a large motion passed by the artificial anus, the patient being kept on his right side so that motion might flow well away from the wound. After the bowels had acted the parts were cleaned and a fresh sponge replaced, so as to prevent any further action until the next day.

June 4.—Four days after the operation flatus was passed by the rectum, and when the sponge was removed from the cæcal opening no motion came away.

6th.—The patient complained of pain in the abdomen. An enema, 5 ounces of olive oil, was given, and three hours later 1 pint of soap and water, and small motion was passed.

9th.—The collodion and gauze was removed from the abdominal wound, which was found healed; all the stitches were removed.

I may here state that the sponge in the artificial anus was daily removed to allow the bowels to act, and then a new one replaced. Flatus was constantly passed by the rectum, and a good amount of fæces at times.

13th.—When the bowels acted by the artificial anus the sponge that was placed there was lost. The house surgeon, Mr. Cooper, carefully examined the opening, but not feeling the sponge, concluded it had passed out with the fæces, and had been thrown away.

14th.—The patient was operated upon again to close the opening in the cæcum. First a sponge was placed in the opening to prevent any escape of fæces during the operation. An incision was then made through the skin around the opening, the incision being about $\frac{1}{4}$ inch from the orifice, the peritoneal cavity opened, and so the opening in the cæcum freed from its attachment to the skin. The cæcum was then drawn well out of the abdomen, and the orifice with the small piece of skin attached carefully cut away from the cæcum. The fresh opening in the cæcum was then sewn up first, the mucous membrane edges brought together, and the serous edges of the incision united with Lembert's sutures.

The gut was then well washed and returned into the abdomen, and the wound in the belly-wall united in the usual way.

15th.—Little sick during the night, otherwise very well.

17th.—Three days after the last operation the bowels acted freely after an enema, and in the motion was found the sponge which was lost from the artificial anus on the morning of June 13.

This was extremely satisfactory, as it told me the part where the stricture had been resected was quite sound, and, moreover, very patent as to allow the sponge to pass through it.

21st.—All the abdominal sutures were removed, the wound being soundly healed. The bowels had been acting daily by the rectum.

In a few days' time he was allowed to get up, and left the hospital the end of June perfectly well in every way.

In the early part of August he rode on a bicycle from Southampton to the Great Northern Hospital, London, in a day, and assured the sisters of the ward he was perfectly well.

On September 18 he was again admitted into the Great Northern Hospital, as he said the last few days he had had pains in the abdomen and had been sick. On admission the abdomen was distended, and he was frequently sick. He was given small doses of castor oil, and later on the bowels acted, and he was more comfortable.

September 23 the patient was very ill again; great abdominal pain and some vomiting.

September 24, as he was about the same, I determined to explore again the part where the stricture had been resected, thinking that perhaps the gut had contracted at the seat of resection. Accordingly, under an anæsthetic, an incision was made parallel to the one about the left linea semilunaris, but a little inside it. So the abdomen was opened, and it was found that the peritoneum was studded with hard nodules, and that there were masses in the walls of the small intestines, and great thickening and nodulation of the mesentery generally. The part where the resection was done was perfect—no stricture or contraction whatever. Seeing there was nothing to be done, and believing the nodules to be cancerous, I closed the abdomen. The patient recovered from operation, and stayed in the hospital until October 13, when, against advice, he was taken to his home at Southampton, and was placed under the care of Dr. Robert Walch, to whom I am greatly indebted for the *post-mortem* examination and the specimens. The patient died on November 9, ten months after the first operation.

For the arrangement of the specimens and microscopic examination I am indebted to Dr. Rolleston and Dr. Lee Dickinson.

Mr. Cooper, house surgeon to the Great Northern, took infinite

care of the after treatment of the patient, and to whom I am most grateful for his careful notes.

Speciments represent—

1. The resected stricture.
2. The resected artificial anus.
3. The sponge passed through the gut.
4. The intestines with multiple strictures.
5. The part showing the result of the resection—a small silk ligature remaining to indicate position of resection.
6. Scar showing where the cæcum was sewn up.

Report of Dr. Rolleston.

"I have now examined the stricture, I should think, in five different places. The great mass of the growth is very well-formed fibrous tissue; in part there are most unmistakable appearances of spheroidal-celled carcinoma; this is very rare in the intestine.

"There is so much inflammation and cicatrisation about the stricture that this fibrous increase forms the most noticeable feature in most of the sections. In fact, as I told you, I could not for a long time find any evidence of a malignant growth."

Mr. Harrison Cripps said the case comprised so large a range of surgery that it would be impossible to discuss all the points that suggested themselves. He objected, on philological grounds, to the term "cæcotomy," and suggested "typhlotomy" as more correct and euphonious. They were all familiar with the class of cases of intestinal obstruction in which, from the length of time during which the symptoms had lasted, and the gradual distension of the abdomen, one felt confident that the obstruction was somewhere in the large intestine, although a careful examination might fail to reveal any tumour or other indication of the situation of the obstruction. Assuming that the usual palliative measures had been tried and failed, the surgeon had to ask himself the question, What next to do? Should he make a median incision in search of the obstruction, treating this, if discovered, on the spot; or should he open the cæcum and give temporary relief; or should he perform an inguinal colotomy? Seeing that so many of these obstructions were in the lower part of the descending colon, he thought the best treatment was, in the first instance, to open the abdomen on the left side as for colotomy. They would thus find the obstruction, which if of a simple nature could be relieved forthwith. If extensive or malignant, involving nothing short of a severe operation, the operation could be converted into an inguinal colotomy to afford temporary relief. One might make an incision over the sigmoid flexure, and this might be found empty. In such case the wound on the left side should be closed and the cæcum opened on the right side. They were, it must be remembered, face to face with a condition of things which probably meant the death of the patient in a short

time if left unrelieved. Such a patient was not in a condition to withstand a prolonged operation accompanied by shock. The obstruction having been found, they might even excise the obstructed portion without relieving the obstruction, because the bowel might have been so distended as to have lost for the time being the power of propelling its contents. Excision of the obstruction did not, therefore, always fulfil the indication. Opening the cæcum generally relieved the symptoms, and then, after a few days or weeks, when the artificial anus had become established in the groin and the patient had recovered from the shock, they could put him on a strict diet, thoroughly purge him, and having selected a favourable opportunity, the abdomen could be opened and an attempt made to find the seat of the obstruction. This could be done under these circumstances with a fair prospect of success. The intestine was empty, the patient was in a good condition; and when they had resected the portion of bowel and joined the ends the artificial anus was there in the cæcum to act as a safety valve until the junction had become firm and strong. Then, and only then, this could be closed. He referred to the paper which he had brought before the Society last session, bearing on two cases which illustrated the subject under discussion. He pointed out that the method of fixing the cæcum to the skin of the abdominal wall, including the parietal peritoneum, involved such a degree of tension, except in thin patients, that, if the cæcum were distended, the sutures might easily be torn away. It was better to make a small opening in the cæcum, stitching the edges to the parietal peritoneum, and allowing the bowel to drop back to the level of that structure. By this plan there was much less risk of the sutures giving way should the patient strain or vomit.

Mr. Swinford Edwards agreed as to the propriety of making the opening in the left inguinal region, although the effect of doing so in the author's case would have been that the patient, who, as it was, had to undergo three operations, would have had to submit to a fourth. In respect of this particular case, therefore, the author had certainly acted for the best. He asked why the author had allowed the cæcum with the clamp to drop back into the peritoneal cavity, and also what was the cause of death?

Mr. Allingham, in reply, said that in these cases the intestines were generally much distended, and sooner than fix them to the abdominal wall or peritoneum in any way he preferred to use a small Paul's tube. By picking up the intestine and making a small slit in it a Paul's tube could be passed in and fitted with a rubber tube, through which all discharges could be taken away. If the tube were used there seemed very little necessity for putting in any stitches at all except, perhaps, one or two to keep the gut in place. What he had done was to open the cæcum and stitch it to the abdominal wall as far as he could, and to make sure that there should be no extravasation of fæces for a few hours he simply applied a pair of Spencer Wells' forceps. These were taken off in eight hours, by which time plenty of lymph had been thrown out. With reference to the opening in the cæcum in this case, he referred to another case of a patient who had suffered from a tendency to intestinal obstruction for several months, complete for ten days. This led him to suppose that the seat of obstruction was low down, so he opened the abdomen in the left inguinal region. He found the gut much distended, and opened it as no relief to the obstruction was obtained. He therefore made an opening on the right side over the cæcum, which was also much distended, so he carried the examination further, and at the junction of the jejunum

and ileum he found two coils of intestine matted together. In one there was a firm fibrous stricture. The coils of gut were separated and the stricture divided longitudinally, and united by enteroplasty and returned into the abdomen. The man got well without a bad symptom, though the case showed that although the symptoms might point to the seat of the obstruction being in the large intestine, it might be elsewhere.

May 7th, 1894.

THE STARTING POINTS OF TUBERCULOUS DISEASE IN CHILDREN.

By J. Walter Carr, M.D., M.R.C.P. Lond.

In the tuberculous diseases of adults three points stand out in sharp contrast with those of children: the first is the enormous predominance of phthisis, or, to use a more accurate term, of pulmonary tuberculosis; the second is the comparative tendency to localisation of the disease, usually in the lungs, as compared with its marked generalisation in children, for even when pulmonary tubercle is complicated with laryngeal and intestinal lesions, these latter must be regarded simply as local and secondary infections and not as due to any general dissemination; the third is the very subordinate part taken by the lymphatic glands in adult tuberculosis as compared with their immensely important *rôle* in children. To a very large extent tuberculous disease in adults means tuberculous disease of the lungs, so frequent is the occurrence of phthisis, so comparatively rare are the other forms of tuberculosis apart from pulmonary disease; for even when tuberculous meningitis, acute miliary tuberculosis, or tuberculous ulceration of the bowels do occur, they are commonly secondary to some primary lesion in the lungs. As Dr. Wilson Fox* puts it: "Louis's law that after puberty the lungs are almost invariably found affected when any other organ suffers, has received to the present day the nearly universal assent of all observers. The point also noticed by Louis, that the lungs are equally, if not more, affected than any other organ, has been verified, at least for adults, to a nearly

* "Diseases of the Lungs and Pleura," p. 600.

equal degree." Moreover, in adults the disease runs a fairly definite course, commencing at one apex and spreading downwards with more or less rapidity. In children, on the other hand, pulmonary tuberculosis, though sufficiently common, is only one of the many forms in which tubercle may attack them, and certainly occupies no position of commanding prominence over tuberculosis of other parts; it is, moreover, not very often primary in the lungs, and when it does occur, does not progress nearly so definitely from apex to base. Secondly, as to the dissemination of tubercle in children. I have notes of 120 necropsies made at the Victoria Hospital, Chelsea, upon children suffering from tuberculous lesions, and in no less than 82 the disease was more or less generalised, by which is meant that the tuberculous lesions found were not merely the result of simple extension by continuity, or of direct infection from one part to another, as of the bowel from the lung, but that either miliary tubercles were present in several or in most of the organs, indicating a common simultaneous origin from some infective centre, or else that there were several quite independent tuberculous centres in different parts of the body. In 13 of the 120 cases glands alone were implicated, in 13 more death had occurred from some other cause, whilst the tuberculous lesion was still limited to one organ, and in only 12 children (five of whom were over five years of age) had a localised tuberculous process been the actual cause of death. The *rôle* of the lymphatic glands in the tuberculous diseases of childhood will be discussed fully later on. It ought to be premised that my remarks refer mainly to young children; no hard-and-fast line can be drawn as regards age, but undoubtedly the distinctive characters just mentioned are most marked in infancy, and tend more and more to approximate to the adult type with each year of life, certainly after five years. Fifty-three of my cases were under 2 years of age, and only 20 over five years.

It is evident that the study of tuberculosis in children is in many respects a much more complex matter than it is in adults. In the latter the bacilli enter, in probably the great majority of cases, with the air in respiration, find a lodgment at or near the apex of the lung, either in the air vesicles or in the pulmonary absorbents, and there start a definite lesion, which, when it ends fatally, does so usually from the extent and severity of the local process. So far the etiology is comparatively simple;

but in children, and especially in infants, the germs seem to obtain access in several different ways, to start the primary lesion in many different organs, and ever to tend to set up general infection through the lymphatics or blood stream. According to Dr. Burdon Sanderson* one-third of the young children who die in hospitals die from tuberculous diseases, and statistics, worked out by Dr. Sturges† from the *post-mortem* records of the Children's Hospital, Great Ormond-street, and by myself from those of the Chelsea Children's Hospital,‡ give practically the same result. In view of a mortality so enormous it becomes obviously a matter of the greatest importance, from the point of view of prophylaxis, to ascertain in what way the bacilli usually obtain entrance, and in what part is usually situated the primary focus whence infection is so apt to spread into all parts of the body. With this object I have carefully gone through the *post-mortem* records of the 120 cases before mentioned, and have endeavoured to ascertain as accurately as possible in each where the disease actually started. In only four cases of generalised disease was no centre discovered. Its apparent absence in such a small number affords no ground for supposing that none existed; when we see how small and difficult of detection it often is, how it may be merely a slightly enlarged caseous gland, or a minute focus in bone, no wonder that in a small percentage of cases it is never found. In 11 instances caseous centres existed in several and widely separated parts of the body, and it was not possible to say which was the primary lesion; in fact, it seems only reasonable to suppose that multiple tuberculous affections in the same subject may be sometimes altogether independent of one another. Dr. Fagge§ recorded several such cases. In 13 children the tuberculous mischief was confined to the glands—in 7 to the bronchial, in 5 to the mesenteric, and in 1 in both sets. Ninety-two cases are left: of these the mischief apparently began in or was limited to the bones or joints in 7 (including 3 of middle-ear disease), in 47 it probably commenced in the thoracic glands, in 13 in the lungs, in 8 either in the lungs or the thoracic glands, in

* 'Transactions of the Hygiene Congress,' 1891: Proceedings of Section II, p. 184.

† 'The Lancet,' November 17, 1888.

‡ 'International Medical Magazine,' 1893, p. 498.

§ "Principles and Practice of Medicine," third edition, vol. i, p. 320.

6 the starting point seemed to be in the intestine, in 7 in the mesenteric glands, in 2 in the cervical glands, and in 2 in the kidney.

The tuberculous disease was, of course, not generalised in all these cases, though in only a few was it limited to one organ or cavity, but this does not affect the object of the inquiry, which is to ascertain, not how the disease terminates, but where it begins. As a matter of fact there is, in children at any rate, no hard-and-fast line between the local and general varieties of tuberculosis; acute miliary tuberculosis may be set up by one small caseous gland, or, on the other hand, it may develop in a case of advanced pulmonary tuberculosis which by itself would soon have proved fatal; in some cases we find every organ thickly studded with tubercles, in others a few scattered miliary tubercles are to be detected in some organs only.

The figures given above certainly do not at all adequately represent the frequency with which tuberculosis starts in the joints or bones and in the external glands, especially the cervical; for as these parts are accessible to operation the disease is with increasing frequency removed by surgical interference before, by affecting internal organs, it has time to bring about a fatal issue. Moreover, those cases of joint disease which do badly are not likely from their chronicity to die in a general hospital; whilst caseous cervical glands seem rarely to be a starting point for general infection, as Mr. Pridgin Teale* has put it. "In most instances disease of the cervical glands, whatever its origin, is practically a local disease, and needs to be dealt with by local measures, and it is but rarely the expression of a general constitutional defect." Possibly this is connected with the fact that bacilli seem to be few in the scrofulous glands of the neck.† This reservation being made, the most striking facts elicited by the above figures seem to be: (1) the enormous proportion of cases in which the disease starts in the glands; and (2) the great preponderance of primary disease in the chest as compared with the abdomen. We have 13 cases in which the disease was limited to the glands and 57 in which it seemed in all probability to have started in them—viz., in the thoracic in 47, in the mesenteric in 7, in the cervical in 2, and either in the thoracic or mesenteric in 1. In addition to these 70 cases, there are 8 others in which it had started either in the

* 'Brit. Med. Jour.,' vol. ii, 1893, p. 1142.

† 'Les Bactéries,' Cornil and Babes, third edition, vol. ii, p. 411.

lungs or the thoracic glands, whilst in 9 of those in which no one primary centre could be certainly determined on, there seemed to be a considerable probability at least of its being in the internal glands. Thus of 120 cases there are 70 (58·3 per cent.) in which glands were almost certainly the primary focus of infection, and 17 (14·2 per cent.) in which they were so with considerable probability. If, however, we divide the cases according to age, the important part taken by the glands in the tuberculous affections of early childhood becomes even more marked, for in those under five we find glands to be almost certainly the primary focus in 64·5 per cent., whilst in those aged five years and upwards they were so in only 37 per cent. The special incidence of primary glandular infection on the earlier years of life is well shown in the following table:—

—	Cases.	Primary focus in glands.			
		Almost certain.	Doubtful.	Total.	Per cent.
Under 1 year	28	19	4	23	82·1
Between 1 and 2 years	25	16	7	23	92·0
„ 2 and 3 years	16	10	4	14	87·5
„ 3 and 4 years	19	12	1	13	68·4
„ 4 and 6 years	12	7	—	7	58·3
6 years and over	20	6	1	7	35·0
Total	120	70	17	87	72·5

As regards the commencement in the thorax or abdomen, there were 79 cases (65·8 per cent.) in which the disease most probably started in the lungs or bronchial glands, 20 (16·7 per cent.) in which it seemed to have begun in the intestines or mesenteric glands, and 6 in which it was not possible to decide between the two.

Now, if we were dealing only with cases of advanced caseation in the bronchial or mesenteric glands, with more or less tuberculous mischief in the lungs or intestines respectively, it might easily be objected that the disease was, after all, merely secondary in the glands; for it is well known that, once started in them,

tuberculous infection will often progress to caseation much more rapidly than in the organ primarily affected. There are, however, several objections to such a view. In the first place, we find many cases in which the glands alone are affected, the most careful search failing to reveal the slightest indication of any lesion in the organ with which they are connected. In other instances, again, we have evidence of a condition certainly extremely rare in adults—viz., extension of the tuberculous affection from the glands to adjacent organs. In young children this seems to be by far the commonest way in which destructive tuberculous disease of the lung occurs; it was long since described by Dr. Charles West* under the term "bronchial phthisis," and is also well described and illustrated by Dr. Ashby and Mr. Wright.† In these cases we find advanced caseation of the bronchial glands round the root of a lung, and similar smaller glands embedded in the lung substance; the latter soften and discharge their contents into the bronchi, leaving small cavities. The disease advances by continuity into the adjacent lung tissue, until at last the lung, or at least one lobe, for some distance round its root is converted into a caseous mass riddled by small cavities; further out isolated caseous nodules are met with, evidently of more recent formation, whilst the apex and peripheral parts of the lung are either perfectly healthy or contain only scattered tubercles. A more complete contrast with the appearances presented by the ordinary phthisical lung in adults, in which the mischief starts at the apex and gradually spreads downwards, and in whom even secondary infection of the bronchial glands probably occurs in only from 30 to 40 per cent. of the cases, can hardly be imagined.

Of course, in many advanced cases in which the disintegration of the lung is very extensive it may not be possible to say definitely where the starting point was; but whenever in children we find changes most advanced at the root of a lung we may, I believe, very fairly assume that the glands formed the starting point in the manner just described, for in a series of *post-mortem* examinations every intermediate step can be traced, from the commencement in the glands onwards to complete destruction of the lung, and, short of the unattainable possibility of watching the progress of the disease in a single case, no better testimony can be adduced.

* "Diseases of Childhood," seventh edition, p. 52.

† "Diseases of Children," second edition, p. 22.

The clinical evidence is also corroborative; advanced pulmonary tuberculous disease in young children is often overlooked, because the physical signs are absent in the usual position and can only be detected on careful examination in the interscapular region over the root of the lung. In some cases, no doubt, rapid and diffuse caseation of a lung is brought about by rupture of a softening gland into a bronchus and inhalation of the infective products into the bronchioles; the extensive resultant mischief would tend to mask the primary causative lesion. Several such cases of pulmonary tuberculosis starting in the bronchial glands I have described at length in a paper in the 'International Medical Magazine' for July and August, 1893.

Probably all observers will readily admit not only the possibility, but also the frequency, of primary glandular affection, and will endorse the words of Dr. Burdon Sanderson at the Hygiene Congress of 1891:—"The bacillus is capable of finding its way into the lymphatic system without leaving behind it any appreciable traces of its presence at the portals by which it has gained admission." Cornil and Babes* have shown by experiments that bacilli introduced into the intestine of the guinea-pig can pass through the epithelial covering without the epithelium being injured, and are diffused in the tissue of the mucous membrane; they enter very rapidly by the lymphatic channels into the mesenteric glands. The same observers† state also that they have followed, in tuberculosis of the pharyngeal mucous membrane, the passage of bacilli between the intact epithelial cells covering the mucous membrane. But a far more difficult question at once presents itself. Is the infection of the glands always or usually direct through the lymphatic channels from the particular organ or area of skin with which the glands are connected; or is the infection indirect through bacilli circulating in the blood stream, and lodging and developing in any glands which happen to present a favourable soil by reason of their being in a condition of irritation and hyperplasia? The question is an important one to decide, for if primary glandular infection were usually due to bacilli in the blood stream which had obtained entrance in some distant part, as for instance, if caseation in the bronchial glands were often set up by bacilli entering through the intestine, or *vice versâ*, it would be

* "Les Bactéries," vol. ii, p. 423.

† *Ibid.*, vol. ii, p. 357.

almost impossible to find out the most frequent points of entry, the situation of the primary focus would be largely a matter of chance, and, at any rate from a practical standpoint, would be of comparatively little importance. Nor, in such a case, would experiments on animals be likely to give results applicable to man, for the conditions would be entirely dissimilar. We should experiment on presumably healthy animals, in whom, therefore, if infection was set up at all, it would be either local—at the point of introduction—where the poison would be most concentrated, or else at some one part peculiarly prone to acquire the infection, a part or organ which would probably be the same for each species of animal experimented on. On the other hand, when infection through the blood stream occurs in children, it occurs in those with so-called scrofulous tendencies, in whom groups of glands are already predisposed to receive the infection, and, therefore, no matter where the point of entry may have been, the bacilli might attack in one case the bronchial, in another the mesenteric, and in a third the cervical, glands, according to which set was in the most unhealthy condition. Conclusions drawn from *post-mortem* statistics and appearances can, then, only be of value if we may assume that at any rate a primary lesion in the mesenteric glands usually means infection directly through the intestines, and one in the bronchial glands infection through the lungs. Are we justified in making this assumption?

Infection of the external lymphatic glands certainly seems at times to occur through the blood stream. Dr. Ashby* strongly supports this view; he says: "Tubercle bacilli presumably enter with the breath or in the food, and find their way into the blood current, starting a tuberculous process in those parts only which are in an inflammatory or unhealthy condition." Undoubtedly, a non-tuberculous lesion—*e.g.*, a patch of simple eczema or a carious tooth—is often followed by caseation of glands, but in such a case the bacilli may enter at the primary seat of lesion without infecting it; but Lebert† states that in 158 cases of primary external gland affection 77 had no complication, not even a skin eruption. This apparently primary glandular caseation seems to occur most frequently in the cervical glands, and it is very probable that the

* "Keating's Encyclopædia of the Diseases of Children," vol. ii, p. 147. Article, 'Scrofulosis.'

† "Klinik der Brustkrankheiten," vol. ii, pp. 162, 372.

bacilli obtain entrance through an unhealthy naso-pharyngeal mucous membrane, and especially through the tonsils, more often than is generally supposed, for tubercle bacilli have actually been found in the crypts of the tonsils. Still a residue of cases must probably remain, explicable only by infection through the blood stream, and the possibility of this is strongly supported by the many cases of tuberculous joint disease which follow upon a slight injury; in these the infection can only conceivably come from bacilli circulating in the blood and lodging in the damaged part, and we have a somewhat analogous example possibly in the readiness with which a trivial injury will set up an acute gouty arthritis in a predisposed subject. There is, moreover, direct experimental evidence in favour of this view, for Dr. Burdon Sanderson says: "My own early experiments showed me that peribronchial nodules were among the most constant and the earliest of the lesions in artificial tuberculosis of guinea-pigs as produced by subcutaneous inoculation. In this case the virus is unquestionably not inhaled, but brought to the affected organ by the blood stream." On the other hand, in whatever way the external—*i.e.*, practically the cervical—glands acquire the tuberculous infection, and with them just now we are not so much concerned, it does seem most improbable that, as a general rule, the internal glands should be infected through the blood stream. Here, however, another important question at once arises. Do the bacilli which enter the body through the lungs or intestines pass at once into the blood current, or do they usually or always get into the lymphatic channels? If the former, infection of the glands through the blood must be common; if the latter, it is most improbable that bacilli should pass harmlessly and unharmed into the blood through one set of lymphatic glands, subsequently to infect another set.

Now, so far as I am aware, we cannot deny the possibility of direct entrance into the blood-vessels, but all the available evidence seems distinctly to show that entry by the lymphatics is, to say the least, the more usual. We know that to find a tubercle bacillus in the blood is a thing unknown, except in very rare instances and in cases of generalised tuberculosis, and if bacilli were often present there, surely general infection would be more frequent than it is. The well-known fact that pigment granules are conveyed through the lung and distributed to the bronchial glands by the lymphatic channels, suggests very strongly that

bacilli would follow the same course, and subcutaneous injection of a region with tubercle bacilli causes first tubercles or tuberculous abscess of the connective tissue and then lesions of the neighbouring glands.

In 1884 Baumgarten* showed that a couple of ounces of milk, to which a pure culture of the tubercle bacillus had been added, were sufficient to produce characteristic tuberculous lesions in the intestine of a rabbit, and that with the utmost precision and certainty, and other observers have found that the milk of tuberculous cows produces tuberculosis of the alimentary tract or of the mesenteric glands. These experiments are of the greater importance because if primary tuberculosis of the intestines or mesenteric glands be set up at all by direct infection, it is undoubtedly mainly by the agency of milk. Wesener found that an injection of tuberculous sputum into the stomach failed to produce ulceration of the bowel, but the mesenteric glands were infected, whereas injection of the sputum directly into the bowel caused intense tuberculosis of the gut. The clinical evidence is corroborative; in the great majority of the ordinary cases of phthisis it will probably be admitted that the infection is brought directly by the inspired air; still stronger is the evidence in the intestinal tuberculosis secondary to phthisis; this is without doubt due to the swallowing of infectious sputum, direct infection of the bowel being the very frequent result. It would seem, therefore, that we may fairly conclude: (1) that a primary lesion in the lungs or intestines means a direct local infection; (2) that bacilli may pass through the lungs or the intestinal walls without producing any recognisable lesion, and that they then, at least as a rule, enter the lymphatic channels and not the blood-vessels; and (3) that a primary tuberculous lesion in the mesenteric or bronchial glands is due usually to bacilli which have entered through the intestine or lung respectively, and not at some remote point. Even though caseation of the cervical glands may more often be due to infection through the blood, yet its frequency in them, as compared with its rarity in the axillary and inguinal glands, strongly suggests that direct infection is the more common. Of course the miliary tubercles or minute ulcers found in the intestines, glands, and all parts of the body in general tuberculosis are obviously due to infection through the blood.

* 'Ueber Tuberkel u. Tuberculose,' p. 113.

I shall pass on now to the important question of the relative frequency of primary infection in the thorax and abdomen respectively, or, in other words, How do tubercle bacilli usually obtain entrance into the bodies of young children? In my 120 cases I found caseous bronchial glands in 96 cases, 80 per cent.; caseous mesenteric glands in 65 cases, 54 per cent.; tuberculous disease of the lungs in 90 cases, 75 per cent.; tuberculous disease of the intestines in 66 cases, 55 per cent.; mesenteric glands alone caseous in 5 cases. These figures, however, expressing merely the actual presence at the necropsy of tuberculous disease of the parts mentioned, very inadequately represent the preponderance of primary disease in the thorax over the abdomen, for in the great majority of cases the tuberculous process was more advanced in the thoracic than in the mesenteric glands, and in the lungs than in the intestines. For instance, in the 66 cases in which the bowel was involved, in only 17 were the ulcers large and evidently of old standing, and in many even of these the primary focus was obviously situated elsewhere, often in the lung, for in eight there were extensive pulmonary cavities, and children must naturally be peculiarly prone to secondary intestinal infection from swallowed sputum owing to their inability to expectorate. In many cases the intestinal lesions were a part simply of a general tuberculosis. The same observations hold good with regard to the glands; advanced and extensive softening was found far more commonly in the bronchial than in the mesenteric. Without going further into detailed figures, let it suffice to repeat the conclusions already given that in 79 of the 120 cases the disease probably started in the thorax, in 20 in the abdomen, and in 6 either in one or the other cavity. Dr. Sims Woodhead* has discussed this question, and, from an analysis of 127 necropsies on tuberculous children, inclines to the belief that the primary focus is most frequent in the mesenteric glands, especially in children between one and five and a half years of age, the years during which cow's milk must form so important an element in their diet. In his 127 cases he found caseous bronchial glands in 96 cases, 75·6 per cent.; caseous mesenteric glands in 100 cases, 78·7 per cent.; mesenteric glands alone caseous in 14 cases.

The percentage of cases in which the bronchial glands were

* Lectures on Tuberculosis and Tabes Mesenterica, 'The Lancet,' July 14 and 21, 1888.

involved is much the same as in my series, but Dr. Woodhead's cases are remarkable for the very large proportion of mesenteric gland disease. Other observers have recorded figures more nearly approximating to my own. Thus Rilliet and Barthez* found the bronchial glands affected in 79 per cent., and the mesenteric in 46 per cent.; and Simmonds† the bronchial and tracheal in 73 per cent., and the mesenteric in 46 per cent.; whilst Dr. Walter Colman,‡ in an analysis of the distribution of tubercle in abdominal tuberculosis from necropsies at the Great Ormond Street Children's Hospital, found a smaller proportion of mesenteric (66 per cent.) and a larger one of thoracic gland tubercle (79 per cent.) than in Dr. Woodhead's cases, and he notes that in 12 cases in which the intestinal ulceration was extensive he found advanced pulmonary tuberculosis, with cavities in no less than 8; but I would repeat once again the really important point to ascertain is not the proportionate frequency of caseation in particular glands, but in which group is the process most advanced—*i.e.*, in which did the disease first start—and on this point I would simply endorse absolutely the following words in Dr. Colman's paper: "While not doubting the infection by milk in some cases, I am led to attach more importance to the condition of the thoracic lymphatic glands, as the process was more advanced in them, as a rule, than in the mesenteric glands, and in several they were extensively caseous when the mesenteric glands showed little or no change."

It might be argued that tuberculous lesions in the abdomen, particularly in the mesenteric glands and peritoneum, are more frequently recovered from than similar lesions in the chest, and that, therefore, fewer examples of the former are found on the *post-mortem* table; but, if this were so, then amongst those in whom tuberculous disease is discovered accidentally, death having occurred from some other cause, we should expect to find an undue proportion of abdominal mischief; but so far from this being the case, I find amongst my cases that in 13 children showing glandular lesions, only the bronchial glands were affected in 7, the mesenteric in 5, and both sets in 1 case; whilst

* "Maladies des Enfants," third edition, vol. iii, p. 846.

† 'Beitr. z. Statistik und Anatomische Tuberculose im Kindesalter, Diss.,' Kiel, 1879.

‡ 'Brit. Med. Jour.,' vol. ii, 1893, p. 740.

in 13 with other tuberculous lesions, not actually the cause of death, in 5 the chest only was affected, in 2 the abdomen only, and in 6 both cavities, but 2 of the latter were practically ordinary cases of phthisis in girls of 8 and 12 years respectively, in whom the intestinal ulceration was obviously secondary to the pulmonary. Thus of a total of 26 cases we have thoracic lesions only in 12, abdominal only in 7, and both in 7. Certainly, so far as they go, these figures do not support the idea that the frequency of abdominal lesions is under-estimated on account of their more usual recovery. The excessive incidence of tuberculosis on the thoracic over the mesenteric glands favours the idea that the bacilli enter the glands directly from the lungs or bowel respectively, for if infection through the blood stream was the more frequent we should expect the mesenteric glands to be affected at least as often and as soon or sooner than those in the thorax, for amongst the improperly-fed children of the hospital-patient class intestinal catarrhs, leading to proclivity of the mesenteric glands to infection, must be both more common and persistent than bronchial catarrhs, with their ill effects on the thoracic glands, and the glands most frequently irritated in this way would certainly be the most prone to become caseous if the bacilli entered them from the blood stream. Dr. Woodhead lays stress upon the special frequency of mesenteric gland infection in children between 1 and $5\frac{1}{2}$ years; however, in my cases, I found 16 out of 28 under 1 year with mesenteric gland infection, as against 37 out of 65 between 1 and 5 years of age, or almost exactly 57 per cent. in each period. As a matter of fact, I do not think that much distinction as regards food can be drawn between the different ages, for probably hardly any of the children under 1 year had been fed exclusively, and many probably hardly at all, from the breast.

The most important general conclusions to be drawn seem to be these: 1. That tuberculous disease in children commences usually in the glands, the liability being at its maximum during infancy and early childhood and rapidly decreasing in later childhood. That caseous glands, especially the internal ones, may (*a*) remain quiescent for an indefinite period; (*b*) start tuberculous mischief in adjacent parts, especially the lungs, by direct extension; and (*c*) set up general miliary tuberculosis. 2. That the internal glands at any rate are probably most often infected directly from the organ with which they are connected, although the possibility

of infection through the blood stream must not be forgotten. 3. That tuberculous disease starts much more frequently in the thorax than in the abdomen, and certainly far more often in the thoracic than in the mesenteric glands. We must avoid being misled by the far too frequent use of that much abused term "consumption of the bowels," which, as employed by the laity, indicates simply marasmus due to improper food, and very rarely any tuberculous lesion. Of course, this does not for a moment throw any doubt upon milk as a possible source of tuberculous disease; on the contrary, experiments on animals have shown that milk containing tubercle bacilli is highly infective, and there seems no reason why the results so obtained should not be directly applicable to man; all I would say is that this does not seem to be by any means a frequent mode of infection as compared with that through the lungs. At the same time the importance attached by Dr. Woodhead, on the basis of his statistics, to the mesenteric glands, indicates the necessity of a further and prolonged investigation of the pathological evidence, not in one place only, but in all parts of the country, for the conditions producing tuberculous disease may vary materially in different localities. 4. That glandular disease may often exist alone and quite unsuspected; in very many cases, doubtless, it is quite impossible of diagnosis; still, in dealing with obscure febrile conditions in children it is well to realise the very definite possibility of the symptoms being due to caseation in glands, to make every effort to discover their existence, and to use appropriate medicinal and climatic treatment. The condition is one which, not being in evidence, is very apt not to be thought of, and if not borne in mind will certainly never be diagnosed. 5. But, after all, by far the most important treatment is the prophylactic. We may aim at excluding sources of infection in milk, raw meat juice, &c., and, still more important, in the air; but, do what we can, under present circumstances bacilli must obtain access—they are probably too omnipresent to be excluded. We must therefore increase the resistant powers of the system to their entry, above all by keeping the mucous membranes healthy. Whether the glands get infected directly through the lymphatic channels or indirectly through the blood stream, the organisms must in every case have passed in through the mucous membrane, and through a healthy one they probably cannot penetrate. We have, therefore, to try to prevent gastro-intestinal and respiratory

catarrhs, and especially to avoid their becoming chronic; to deal promptly with, and if possible to prevent, rickets, the great cause of such catarrhs in early childhood; and to take especial care of children during convalescence from measles, whooping-cough, and other acute specific diseases, so liable to depress the vitality of the body generally, and the resistant power of the mucous membranes, as well as the filtering power of the glands, in particular.

For the present, by proceeding on such lines, we are most likely to check the enormous mortality from tuberculous diseases during infancy and childhood. We can probably do more by efforts to provide an unsuitable soil than by trying to exterminate the germ, although, to a large extent, the conditions which lower the resistant power of the body are also those under which tubercle bacilli are most likely to be abundant.

The PRESIDENT commented on the fact that so large a proportion of the children were infected through the air, rather than by the food they ate, a circumstance which one might have expected in children who come under hospital treatment, living, as they did, under such unfavourable conditions of general hygiene, in overcrowded unhealthy dwellings.

Dr. SIDNEY MARTIN said that while the paper might be an accurate record of the *post-mortems* of tuberculous children, he could not admit that the author had fairly stated the proportion of cases in which primary infection through the intestines occurred. He admitted that it was very difficult to obtain actual records of *post-mortems* in children, showing what the proportion really was. When a child died of tuberculosis, unless it happened to be primary lung tuberculosis, it was and must be difficult to tell where the primary infection took place. That difficulty had been experienced by everyone who had undertaken researches in this direction. If, however, many such records as those brought forward by the author were made and published, one would after a time be in a fair way to come to some conclusion as to the ways in which tuberculous infection occurred in children. Most of the points touched upon by the author had been under discussion ever since the infectivity of tuberculosis had been demonstrated in the sixties by Villemin and Chauveau. The author, however, appeared to consider certain points as proved which were not so, such, for instance, as the degree of infectivity of food. A good deal had been written on the subject, but if one took the trouble to read the facts it would be seen that really very little was absolutely known on the subject, experimentally or otherwise. That observation indeed applied to many points in the great question of the dissemination of tuberculosis. He alluded to some results obtained by him from experiments during the last few years bearing on this question of infectivity, an important subject, because in the future the treatment of tuberculosis depended on its prophylaxis. The ordinary methods of infection were undoubtedly through the alimentary tract or through the lungs. He proposed to divide such cases, both *post-mortem* and experimental, into three classes: (1) cases in which there was a definite primary lesion at the seat of infection; (2) cases in which no such lesion existed at the seat of infection; and (3) cases in which there was an insignificant or a healed local lesion,

the infection of the body as a whole occurring usually at a much later period. Lesions of the large and small intestines are instances of tuberculous infections of the kind met with in children or in adults dying from phthisis. It was, however, of those cases where no lesions existed at the seat of infection, cases which were a great puzzle to all pathologists ever since they had been properly investigated, *post-mortem* cases, for example, of primary tubercular meningitis and joint disease, primary lesions of the mesenteric or thoracic glands, or of the cervical glands. It is extremely difficult *post-mortem* to find out where tubercule bacillus had entered the body. Dr. Martin then passed on to discuss the experimental results obtained by himself, because they explained to some extent these cases of primary tuberculosis. The author had mentioned the experiment of injecting sputum into the stomach of the guinea-pig without giving the animal tuberculosis, whereas when sputum was injected into the intestines the disease developed. That was an example of an utterly futile experiment. It was not a fact that if injected into the stomach the animal did not contract tuberculosis ; on the contrary, if a sufficient quantity were injected it would certainly produce tuberculosis. In all cases if tubercular material were given with the food to a guinea-pig a lesion of the intestines and of the mesenteric glands was produced, followed by general tuberculosis. In only one case out of a large number of experiments did he get an example of infection of the mesenteric glands in the guinea-pig without a lesion of the intestine. The experiment of putting bacilli into milk and giving it to the guinea-pig was rather different from his own experiment, because he had always used bovine or human tuberculous material. It was now well known that they might under certain conditions get infection of the guinea-pig without local lesions of the intestine, and this was well marked in pigs, an animal closely allied to man in anatomical disposition. In the pig a large dose of tuberculous material would produce similar effects to those in guinea-pigs, viz., distinctly tubercular lesions of the intestines and infection of the glands. He alluded to the frequency with which one met with tuberculous lesions of the tonsils in pigs. The cases on which, however, he desired to insist were the cases in which pigs got tuberculosis by feeding, without any local lesion. In all these experiments the pigs were chosen with the greatest care to make sure that they were not tuberculous. They were fed with different kinds of non-virulent tuberculous material, and they became tuberculous. None of them showed any lesion in the intestine, but the following varieties occurred, which were exceedingly like what occurred in human beings. One pig, for instance, showed tuberculosis of the cervical glands alone, and lived for a long time. The animal, in fact, presented the typical scrofulous neck without any local lesion, the tonsils being perfectly normal. In another case the pig developed tuberculosis of the gland below the jaw, and one or two nodules in the lungs. There were pigs in which the mesenteric glands alone were affected, without the mucous membrane being ulcerated. There were other cases in which the animal was infected in the cæliac glands alone, these glands receiving lymphatics not only from the stomach, but also from the duodenum and intestine. In one animal only, infection of the glands of the lesser omentum occurred. In another animal there was evidence of infection of the glands of the lesser omentum, posterior mediastinal glands, and of the epididymis. The last was a vascular lesion, the others corresponding to the lymphatic lesions. He had often noticed in *post-mortem* records of human beings that the primary lesion had often been overlooked. In cases of tubercular menin

gitis they might find a small calcareous nodule in the mesentery, which was the point of departure of the meningeal mischief. It was more frequently in cows that the primary lesion in the intestine might be one small calcareous nodule, the other parts of the body being infected later on, showing how difficult it must be to ascertain *post-mortem* where was the original source of infection. In cases of tubercular glandular affection of the cow, the glands chiefly affected were those in the thorax, the posterior mediastinal and bronchial. Sometimes the pleuræ were affected. The differences observed in the experimental lesions of tuberculosis were based on the dosage. In all cases of infection by the alimentary tract in which no local lesion was present, only a small dose of tuberculous material was given. When the dose was large enough, a local lesion was produced. What one met with in children was often a small dose of poison producing a very insignificant affection ; no local lesions at the site of infection, but a tuberculosis of the neighbouring lymphatic glands from which the serious mischief started.

The PRESIDENT asked if the observation as regards the differences of effect according to the size of the dose applied equally to the poison when nhaled.

Dr. MARTIN, in reply, said he had not made any experiments in that direction.

Dr. ROUTH doubted whether the injurious effect of eating tuberculous food, if cooked, was as uniform as had been stated, for they had all of them probably partaken of tuberculous meat at meals without any evil results. He asked how the poison could get to the blood except through the air breathed. He suggested that the inflammation of the glands was protective. He referred to the case of a child who had an inflamed bronchial gland and a cavity in the lung, which, however, completely healed.

Dr. CARR, in reply, congratulated the meeting on the valuable and instructive statement made by Dr. Martin. He quite agreed as to the difficulty of making out *post-mortem* the original site of infection ; in fact, in many instances he had found it impossible to make it out. It might, however, be discovered in the earlier cases—the cases of patients who died of some intercurrent disease, and in whom the existence of tuberculosis was, so to speak, discovered accidentally. The study of such early cases greatly helped in determining where the disease had commenced in the more advanced ones. He observed that—dealing with young children only—he had not attempted to take up the question of the infectivity of food except in respect of milk, as to the infectivity of which he supposed most of them were agreed. He was glad to have from Dr. Martin a confirmation of his view that caseation in a thoracic or mesenteric gland showed that the poison had been introduced from the organ or part with which the gland was associated. Although the bacillus obtained entrance usually by the lungs or the intestine, it must be borne in mind that distant glands only might be infected, as in Dr. Martin's experiments on pigs. He agreed that the glands did probably act as a filter to stop the progress of the disease. In a number of cases *post-mortem* he had come across calcareous glands which had evidently been the seat of the disease, but had healed up. Unfortunately, however, the disease was very apt to recur with softening, and eventually general infection.

A CASE OF PERFORATION OF A CHRONIC ULCER OF THE DUODENUM SUCCESSFULLY TREATED BY EXCISION.

DEATH TWO MONTHS LATER FROM ACUTE INTESTINAL OBSTRUCTION BY A BAND.

By Henry Percy Dean, M.S., B.Sc. Lond., F.R.C.S.

E. F., a married woman, aged 27 years, was admitted into one of the surgical wards of the London Hospital on the evening of February 17, 1894. She was seen by me about 1.30 A.M. on the following morning, that is, a few hours after her admission, and I found her in the following condition:—

Intense pain was complained of over the whole of the abdomen, perhaps slightly more marked in the epigastric regions. The patient felt very ill, and her expression was exceedingly anxious. Vomiting occurred every few minutes, and much exhausted the patient. The pulse was 120, feeble and regular. The respirations were rapid and irregular, both in force and rhythm. The tongue was slightly furred, and very dry. There was uniform tenderness over the whole abdomen, the distension was moderate in degree, and the resonance of the percussion note was markedly increased. The temperature was 100·6°.

On questioning the patient, it was found that for about a fortnight she had suffered from pain in the chest and pit of stomach, and that her doctor had been treating her for indigestion. The patient had been sick several times during the week previous to her admission, and her bowels had not been opened for seven or eight days. About 24 hours before admission to the hospital, the patient suddenly became much worse, feeling a severe pain in the pit of the stomach, and a sensation of intense weakness. This was soon followed by vomiting, repeated at frequent intervals.

It seemed to me pretty evident that the patient was suffering from acute general peritonitis. The possibility of perforation of the stomach or duodenum was considered, but on the whole I was rather inclined to think that it was a case of mechanical obstruction with general peritonitis. It was decided to operate

at once. The patient was taken to the operating theatre, anæsthetised with chloroform, and an incision, about three inches long, was made immediately below the umbilicus. On opening the peritoneal cavity a quantity of purulent fluid escaped, and coils of intestine, somewhat distended, intensely congested, and covered in places with flakes of lymph, protruded through the wound. No evidence of mechanical obstruction could be obtained, so I increased the incision upwards to the ensiform cartilage, and in a few minutes I found some flakes of lymph in the region of the gall bladder. In the centre of one of these flakes I noticed some gas bubbles, forming a kind of froth. On inserting a probe into the froth, I found that it passed into a cavity, which, on further examination, was found to be the duodenum, the perforation being situated on the anterior aspect about $\frac{3}{4}$ inch beyond the pylorus. Around the perforation a distinct induration could be felt. By means of scissors this indurated area was excised. The portion removed was elliptical in shape, measuring $1\frac{1}{4}$ inch in its long axis, which was parallel with the transverse axis of the gut. The portion excised was found to include the ulcer and a margin of healthy mucous membrane. In the centre of the ulcer was a perforation about 2 mm. in diameter. The floor of the ulcer was white, and the edge of the ulcer was bounded by apparently healthy mucous membrane. The elliptical opening thus made into the duodenum was sewn up by silk sutures according to Lembert's method. The peritoneal cavity was washed out with warm weak boracic lotion, well sponged, and the wound sewn up by stitches passing through the whole thickness of the abdominal wound. The operation lasted 50 minutes.

After the operation the patient was allowed nothing by the mouth. She was fed solely *per rectum* by nutrient enemata and suppositories for 17 days. To allay thirst, 2 ounces of warm water were occasionally injected into the rectum. The patient rapidly improved, was given liquid food by the mouth on the 18th day, and solid food on the 28th day. The abdominal wound healed by first intention, and on March 19, that is, thirty days after the operation, the patient was walking about the ward, going into the garden, and eating ordinary food.

It was decided to send the patient into the country, and so she was kept in the hospital until a vacancy in a convalescent home occurred. Three days before the date on which it was arranged

that she should leave the hospital, that is, on the evening of April 13, the patient complained of some pain in the abdomen, and was sick. The pain continued on Saturday morning, and she was sick again. I saw the patient in the afternoon of Saturday, and found her complaining of a colicky pain in the abdomen. Her general condition was good. I ordered an enema to be given, and all food by the mouth to be stopped. Having arranged to leave London on that day for a short holiday, I asked the house-surgeon to call in one of my colleagues, if the patient's condition did not rapidly improve. No result followed the enema, so the house-surgeon ordered doses of mag. sulph. (ʒj) to be given every hour. Four of these doses were given, and on Sunday morning the patient was so much worse that Mr. Eve was asked to see the patient. Mr. Eve considered that she was suffering from intestinal obstruction, probably caused by a band, and proceeded to perform abdominal section. Ether was administered, and an incision was made through that part of the scar of the former incision that was below the umbilicus. The great omentum was found adherent to the wound, and at the lower part of the scar a band could be traced to a coil of intestine, and this band had caused a kink in the gut sufficient to produce complete obstruction. The band was attached to the gut about 6 inches above its entrance into the cæcum. The coils of intestine on the proximal side of the band were greatly distended and very congested. On the distal side of the band the intestine was collapsed. The band was removed, and immediately afterwards the collapsed coils became distended, showing that the obstruction had been relieved. The peritoneal cavity, which contained some blood-stained fluid, was washed out with warm boracic lotion, and the wound sewn up by silkworm-gut stitches. The operation lasted 45 minutes.

The patient recovered to a slight extent from the shock of the operation, but never thoroughly rallied. She gradually became weaker, and died about 36 hours after the operation.

Post-mortem Examination.—On opening the abdomen a considerable amount of lymph was found upon the intestines, and the peritoneal cavity contained a quantity of turbid fluid. About 3 inches above the attachment of the band to the small intestine was a perforation from which the intestinal contents escaped. A little higher up was another perforation. On opening the intestine it was found that each perforation was in the centre of a

small ulcer. The ulcers were evidently of very acute and recent formation, as the whole thickness of the intestinal wall at these spots was necrosed. There were several other necrotic patches within 18 inches of the obstructed point. For about $\frac{1}{2}$ inch from the pylorus the duodenum was thinner than normal, and the peritoneum over it was puckered. The duodenum was quite healthy, and presented no traces of past or recent ulceration.

Remarks.—This case is of interest from two distinct points of view. First, the successful treatment of the duodenal ulcer; secondly, the unfortunate sequela of strangulation by a band. More especially is the case of interest from the first point of view, because, so far as I have been able to ascertain, no successful result of excision of a perforated duodenal ulcer has yet been recorded. Not long ago Mr. Lockwood read a paper before this Society on two cases of perforation of duodenal ulcers, in each of which he failed to find the perforation. In his cases the perforation was on the posterior wall of the duodenum, and almost impossible to expose. In my case, on the other hand, the perforation was situated in the most convenient spot that could be desired, namely, on its anterior aspect, and the difficulties to be overcome in excising the ulcer and suturing the duodenum were but slight.

As regards the unfortunate result, it is impossible, so far as I can see, to prevent the formation of a band after abdominal section for acute peritonitis, especially acute purulent peritonitis. In these purulent cases, at any rate, I do not think that stitching up the peritoneum by itself, before suture of the abdominal wall, could lessen in any way the tendency to the formation of adhesions between the inflamed, lymph-covered intestines and the abdominal wall.

One is rather inclined to conclude with this statement: that, if after abdominal section an attack of acute abdominal pain and intestinal obstruction supervene, an exploratory operation should be performed as soon as possible, even if the general condition of the patient would, under ordinary circumstances, scarcely be considered grave enough for immediate surgical interference.

I wish to express my thanks and indebtedness to my colleague, Mr. Eve, for his kindness in taking charge of the patient during my absence.

Mr. Lockwood said the author might fairly claim that his was a successful case. What struck him about this particular perforating ulcer

of the duodenum was the extraordinary difficulty of diagnosing, not only the existence of the ulcer, but even of the perforation. The author had candidly admitted that he took the case to be one of mechanical obstruction, and it seemed strange that surgeons should not as yet be able to distinguish between obstruction due to mechanical cause and that due to inflammation. He suggested that the existence of universal abdominal tenderness might, perhaps, have awakened at least a suspicion of the obstruction being due to peritonitis. He had observed that, in cases of perforative peritonitis, not only was the distension universal, but there was also uniform tenderness over the abdomen. The author had referred to the two cases which he (the speaker) had brought before the Society some time since. In one case he said he thought he might have discovered the ulcer and have dealt with it. It was not quite behind the duodenum, and, if it had been diagnosed, he thought it might have been got at. At that time neither he nor anyone seemed to have it clearly in their minds that, if the source of a septic peritonitis could not be found in the lower part of the abdomen, it should be looked for higher up. It was only recently that surgeons had come to think that perforating ulcer of the duodenum was one of the things that they might be called upon to deal with. Although, personally, he did not perform a great number of laparotomies each year, yet he had met with two such cases. In one of them he had suspected it, and being so like the other—the symptoms having come on suddenly with a previous history of some pain in the region of the duodenum—he had a prolonged search for the perforation, without, however, finding it. Even *post-mortem* it was very difficult to find, as it was situated behind the duodenum. Such perforations were particularly favourable for operation if only they could be found; the perforation was usually small, and the surrounding tissue, within a millimetre or two, was healthy and suitable for fixing sutures. He pointed out that Mr. Gould had called attention to the information to be gained from the reaction of the fluid in the peritoneum, he having been led to suspect the nature of the lesion in one case by ascertaining that the fluid was acid.

Dr. Holman alluded to the case of a medical man which occurred many years ago. A diagnosis of duodenal ulcer was formally arrived at. *Post-mortem* confirmed this diagnosis, and if surgeons of that day had had the knowledge of those of the present day, the whole mass of cicatricial tissue might have been removed and the ends brought together. He had had in all some five cases of duodenal ulcer, and of those he had diagnosed he would unhesitatingly have now asked a surgeon to come to his assistance and perform resection of the gut.

Mr. Dean, in reply, pointed out that he had diagnosed general peritonitis, which he thought might be accounted for by a mechanical obstruction. He had thought at the time of the possibility of there being a perforated duodenal ulcer, but the patient did not seem collapsed enough to warrant that diagnosis. He admitted, however, that on reviewing the literature of the subject, these patients did not usually appear as collapsed as one might have expected.

May 21*st*, 1894.

THE ANNUAL ORATION—"A DOCTOR'S HOLIDAY."

By William Miller Ord, M.D., F.R.C.P. Lond.

Mr. President and Gentlemen,—

"Neque semper arcum tendit Apollo."

All men, whatever their occupation, need periods of relaxation from work. These may come in short intervals of the days of work, and are, by common consent, at certain times of the year more extended. Men take their rest in various ways. It is possible for some entirely to forget that to which their lives are in the main devoted and to plunge abruptly into pursuits of altogether different kind. Neither idleness, the "strenua inertia" of the poet, nor distraction, seem to me to be for the physician the most appropriate form of recreation or diversion, if we regard the question from the highest, and also, as I think, the most practical, point of view. It seems to me absolutely necessary that we, who are for the most part of the twelvemonth in close contact with humanity, are studying human beings, and looking on all sides for help in that study, may often find benefit, and always certainly pleasure, when we take leisure in the library, or pleasure afield, to find the truest rest in the riding of some hobby, which gallops one way or the other from man to the nature around him. We can see instances of the usefulness of such extensions of professional occupation into regions of pleasant diversion in such works as that of the late Dr. Paris, entitled "Philosophy in Sport made Science in Earnest," in Sir Thomas Browne, in Sir Henry Holland, and in Professor Gairdner's "The Physician as a Naturalist." The last orator of this society pictured in an eloquent way the help given by literary study to the healer.

I propose to-night to ask you to follow me in a ramble among subjects more or less cognate to our own profession and its studies, including some "horæ subsecivæ" of rest in reading, here and there with divergence into some more remote paths branching off into literature not at all medical. In fact, I am going to ask you to go out with me on my autumn holiday. In the autumn of the

year before last I was staying for a few days at the Land's End. It happened one day that I had engaged a boatman to take me out a-fishing in Whitsand Bay, a mile or so to the north-east of the point. When I arrived after a pleasant walk I found that fishing was impossible by reason of a great swell coming in from the Atlantic; yet the bay itself was free from wind, and the sky was clear, so that the sun struck unhindered through the big green rollers as they broke upon the rocks in the mouth of the bay. The bay is formed by a break in the massive cliffs of this iron-bound coast, and is on the land aspect a wide expanse of yellow sand, sloping upward to a considerable height. To sit upon some rocks emerging from the sand and to watch the sun's rays turned into the most brilliant green, as the rollers swept onward, was for the time a slothful pleasure. Presently, satiated with this, one began to look about and take in more of the surroundings. On the dry sand above high-water mark there first claimed attention a broad band of pale green colour, suggesting the idea of a delicate green veil cast across the bosom of the yellow sand. On investigation this turned out to be a bed of the wave-leaved stock (matthiola sinuata). This sea stock is not in itself a very beautiful plant. Its foliage is coarse, thick, and entirely devoid of symmetry or elegance. It looks like a plant which might have been beautiful, but, like some old statue, has had its fine lines worn away by wind and weather. Its flower is dingy and unattractive, yet its colour, as its leafage was scattered not too closely over the sand, made a beautiful harmony. It had for me, however, a more than redeeming quality. I knew it to be one of those plants which give forth scent at night. Such plants are mostly, in plain terms, ugly. Some of them have a faint scent during the day, increasing through the twilight to the darkness. It was a great delight to me as a boy to be taken of evenings into a little greenhouse containing several specimens of the night-scented stock—matthiola, or hesperis, tristis—and to enjoy the lovely perfume of their flowers, richer and more delicate than the perfume of any day stock. By day the plants were apparently but half alive, and the petals of the flower hung down shapeless, dingy purple, and, as I may perhaps best express it, unkempt. With night the plant developed a new life and exhaled its exquisite odour. I wondered then, as I wonder still, what might be the meaning of this nocturnal activity of a plant. It is certain that in the daytime

plants break up carbon dioxide, retain the carbon, and set free the oxygen. It is probably also true that when the sun's influence is absent they absorb oxygen. How much of this is done by the foliage, and how much by the flowers, I do not know, but these plants have almost always made me think that under a process of oxidation odours were produced from the flowers which could not be evolved when the growing life of the plant was in progress. I suppose that it is certain that this perfume has for its real object the attraction of moths for the purpose of fertilisation. The Cruciferæ generally are, no doubt, capable of self-fertilisation, but in the interest of plants cross-fertilisation is necessary; and so these plants, so unattractive in every way by day, appeal to the sense of smell of vespertinal insects. The whole aspect of flowers which are closed or unattractive by day and open in the evening or at night has been suggestively treated by Sir John Lubbock on "The British Wild Flowers in relation to Insects." The belt of sea stock was, as one moved on shoreward, encircled by a crescent of very different colour, a belt of sea holly. As it breaks from the surface of the sand the sea holly, eryngium maritimum, has marked attractions. The form of its leaves is, indeed, very much like that of the leaves of the common holly. Their colour is very noteworthy. It is the glaucous colour which belongs to so many seaside plants. The word "glaucous" may be taken to mean a green colour overlaid with grey, or with blue, or with a film of white. Probably it has its origin from the sea god, Glaucus, and its meaning is clearly "green, such as of the sea." The eringo flower consists of compound heads of considerable size and rich blue lustre. The blue is not of the violet nor of the cornflower, but rather a rich turquoise. I will give you the description of it by the old naturalist Gerarde: "It breaketh forth on the top into prickely or round heads or knops, of the bignesse of a walnut, held in for the most part by six prickely leaves, compassing the top of the stalk round about: which leaves as well as the heads are of a glistring blew; the floures forth of the head are likewise blew, with white threads in the midst." To find a plant of such great beauty springing from the sand without association of other herbage creates an impression of strangeness and great contrast. All botanists, however, know that this contrast is not by any means uncommon. On the sandy dunes of our coast there springs from the sand a convolvulus, soldanella, surpassing the convolvuli

of the inland in size, in form, and in delicacy of colour, having a corolla of porcelain-like texture; and botanists will also remember the little glaux maritima, with its thickly crowded branches of small, short, closely appressed and pointed leaves, and its small, solid, pink flowers. Beautiful as the sea holly is above the sand, it has an interest below the surface; it has a root altogether excessive in proportion to the size of the plant as seen on the shore. This root is of about the size of the stem of the laminaria, the oar-weed of our shores. To quote Gerarde: "The root is of the bignesse of a man's finger, very long, and so long as that it cannot all be plucked up, unlesse very seldom: set here and there with knots, and of a taste sweete and pleasant."

For at least 300 years—and, I believe, up to the present time—there have been attributed to this root properties of a cordial and restorative nature, nay more, aphrodisiac. Before Gerarde wrote about it the aphrodisiac uses in particular must have been generally known. It appears to have been chiefly candied for use and was at one time produced in large quantities in the south of England, particularly about Colchester. It is evident that, in the days of its repute, the confection was prepared with very great care and not a little skill. Gerarde gives a minute account of the accepted fashion of candying, or "conditing," as he calls it, of eringos.

"The Manner to condite Eringoes.

"Refine sugar fit for the purpose, and take a pound of it, the white of an egge, and a pint of cleere water, boile them together and scum it, then let it boile untill it become to a good strong syrrup, and when it is boiled, as it cooleth, adde thereto a saucer full of rose-water, a spoonefull of cinnamon water, and a grain of muske, which have been infused together the night before, and now strained; into which syrrup, being more than half cold, put in your roots to soak and infuse until the nexte day: your roots being ordered in manner hereafter following: These your roots, being washed and picked, must be boiled in fair water for the space of foure houres, untill they be soft; then must they be pilled cleane, as ye pille parsneps, and the pith must be drawn out at the end of the root, and if there be any whose pith cannot be drawne out at the end then you must slit them, and so take out the pith; these you must also keep from much handling that they

may be cleane; let them remain in the syrrup till the next day, and then set them on the fire in a faire broad pan untill they be verie hot, but let them not boile at all; let them remain over the fire an houre or more, remooving easily in the pan from one place to another with a wooden slice. This done, have in readinesse great cap or royall papers, whereupon you must strew some sugar, upon which lay your roots after that you have taken them out of the pan. These papers you must put into a stove or hothouse and harden, but if you have not such a place lay them before a good fire. In this way, if you condite your roots, there is not any that can prescribe you a better way. And thus may you condite any other root whatsoever, which will not only bee exceedingly delicate, but very wholesome, and effectuall against the diseases above named."

This is what he says about their uses: "The roots of sea holly boiled in wine and drunken are good for them that are troubled with the collicke; it breaketh the stone, expelleth grauel, and helpeth also the infirmities of the kidneys, provoketh urine, greatly opening the passages, being drunk fifteen days together. The roots themselves have the same property if they be eaten, and are good for those that be liver-sicke and for such as are bitten by any venomous beast; they ease cramps, convulsions, and the falling sickness, and bring down the terms. The roots condited or prepared with sugar, as hereafter followeth, are exceedingly good to be given unto old and aged people that are consumed and withered with age and which want naturall moisture. They are also good for other sorts of people that have no delight or appetite to venerie, nourishing and restoring the aged, and amending defects of nature in the younger." It is clear that the aphrodisiac qualities attributed by Gerarde and others to the candied eringo were matter of belief and practical use in former times. The pages of the Elisabethan dramatists teem with allusions to this quality. In the "Merry Wives of Windsor," Falstaff (Act v, scene 5), in need of such help, says as follows: "Let the sky rain potatoes, let it thunder to the tune of 'Green Sleeves,' hail kissing comfits, and snow eringoes." So, abundantly elsewhere. In the plays of the time one finds eringoes mentioned in this sense, and particularly recommended to elderly persons about to marry. The botanists of the time attributed the restorative qualities of the eringo to its cordial influence. This is not improbable, but there is much interest in the associa-

tion of the potato with the eringo for the same purpose. In the "Elder Brother" of Beaumont and Fletcher (Act iv, scene 4) we find as a preparation "potatoes and eringoes, and, as I take it, cantharides." Elsewhere a potato pie has the same function allotted to it. Now it appears that at the time of which we are speaking the word "potato" was applied to several roots, or tubers—namely, to a kind of yam, to the root of a plant belonging to the order Convolvulaceæ, and to the potato as we know it. The first two appear to have been dealt with in common more frequently under the name of "batata" than potato. Both of them were sweet roots, and lent themselves to the preparation of conserves. Neither of them could be cultivated in this country. In an old book I find the following remarks: "Sweet potato: Sisarum Peruvianum: Convolvulus batatas, or Ipomœa batatas. This is probably the dramatist's potato. It is not suitable for cultivation in this country. Gerarde bought roots of this at the 'Exchange in London'; he planted them, but they were speedily killed by the climate."

The potato which we know came into use about the same time as the other kinds. Its ready susceptibility of cultivation has made it practically a natural fruit of the country. Coming in with the others, and having a somewhat similar name, it assumed, in the popular opinion, some of their virtues, and I am inclined to think not without good reason, even though the influence may have been indirect. There is certainly little about the potato to suggest an aphrodisiac property. In thinking, however, over the concatenation of these four roots—viz., the eringo, and the three potatoes—as restoratives, I have been led to the conclusion that the value of them was not altogether imaginary. In the period of which I have been speaking, and still more in earlier days, the population at large was not very well fed. To a considerable extent fresh meat was a luxury; salted meat and dried or salted fish were the main animal foods of the common people, stock fish, salted and dried cod, being very commonly referred to by the comic poets. On the other hand, the use of vegetables seems to have been neglected to a large extent, and there is very little evidence of much systematic cultivation of them, except in the gardens of the well-to-do. Here and there a cabbage may be referred to, generally in terms of depreciation. Probably the cabbages of that date more resembled the cabbage of our cliffs than the great globes

which nowadays are carried in hundreds of thousands to Covent Garden. That the need, however, of the use of vegetable food, in some form or other, was felt, is to be seen in the fact that a great many weeds of the present day were used as or in "sallets." In fact, the notoriously great prevalence of scurvy in those days marks the effect of a diet in two ways defective, and the instinctive search for vegetable foods extended far beyond the limits of the garden of the day. That the need was in considerable excess of the supply is indicated here and there by the apparently unattractive qualities of many of the plants used. One can understand that wood sorrel, for instance, would make a very tolerable salad, and still more may it be said of the "lamb's lettuce" or "corn salad," which, though it rarely appears now at our tables in England, is still in common use on the Continent. This plant is nowadays placed with the valerians, and it may interest you to read to you Gerarde's description of it, with his dissent from this bit of classification.

"Ch. 39. Of Lamb's Lettuce or Corn Salad.

"1. Lactuca agnina. Lamb's lettuce.	2. Lactuca agnina latifolia. Corne sallad.

"The plant which is commonly called olus album or the white pot herb (which of some hath been set out for a kind of valerian, but unproperly, for that it doth very notably resemble the lettuce as well in form, as in meate to be eaten, which property is not to be found in valerian, and therefore by reason and authorities I place it as a kind of lettuce) hath many weak stalks trailing upon ground, with certain edges a foot high, where it grows in most fertile grounde. These herbs grow wild in the corne fields; and, since it hath grown in use among the French and Dutch strangers in England, it hath been sowen in gardens as a sallad herbe. This herbe is cold and something moist, and not unlike in faculty and temperature to the garden lettuce; instead whereof in winter and in the first months of the spring it serves for a sallad herbe, and is with pleasure eaten with vinegar, salt, and oil, as other sallads be, among which it is none of the worst." But when we come to such a thing as "salad burnet," we find a plant with less pleasant qualities much esteemed. It certainly has a flavour of its own, which may be attractive to some palates; but anyone who has chewed it would, I think, only regard it as food suitable for the

lower animals; indeed I should be inclined to think that it was mainly used as a flavouring in a general way. It appears to have been frequently infused in wine, to which it was said to give an agreeable flavour, and, as Gerarde puts it, a "grace in the drynkyinge.'

If one walks along the shore one finds in many places the scurvy grass (cochlearia). I suppose that very few people nowadays use this plant, yet its leaves are succulent and have a slightly pungent flavour. One may see it in enormous quantities at Lymington, on low banks almost dipping into the sea, and can well understand how scurvy-stricken sailors would be eager to avail themselves of its, for them, restorative qualities. It appears to have been largely used formerly, sometimes in the form of the expressed juice put into beer, or in the form of decoction flavoured with pepper, aniseed, &c., or boiled in milk or wine. Now I venture to suggest that the potato, so easily grown and so large in its yield, offered, even while in process of acclimatisation, remarkable satisfaction to the craving for carbohydrates and vegetable juices, and that in doing so it restored the vital activities of the people who could make free use of it; in other words, that it was not in itself an aphrodisiac, but that it became so incidentally by helping to bring up men to the condition of health in which their natural instincts would assert themselves. It is, moreover, worthy of remark that in many parts of Ireland the potato is still regarded as conducing to fertility. Besides being made into pies they were cooked in other ways. I may here quote in regard to this from Lovell's "Compleat Herbal,"* which deals only with plants cultivated in the Botanical Garden of Oxford University, and therefore can only apply to the common potato. "The roots are very nourishing and strengthening, and, being roasted in the embers and eaten in wine, are less windie; also they may be dressed with oyle, vinegar, and salt; but anyway dressed they nourish, strengthen the body, and cause lust." It appears from this passage that the potato salad so popular in Germany is an ancient institution of our own country.

It has been particularly interesting to me to consider what kind of edible plants the scurvy-worn sailor would find at hand on coming on shore. The Umbelliferæ, to which family the Eringo, as you know, belongs, are singularly fond of the sea shore. They are for the most part rather aromatic than

* Oxford, 1665.

succulent, yet the samphire of our cliffs has doubtless formed many a refreshing dish for the mariner. For a moment let us try to enumerate a few of the Umbelliferæ which are found by the sea. Everywhere one finds the carrot, with its slightly hollowed disc of sterile white flowers and its central, velvety, brown-purple, fertile floret. Under the hot sun its foliage assumes rich colours, beautiful to the eye, but not tempting to the palate. Without cultivation its root is of no use. In the same way we may speak of the celery, the parsnip, and perhaps even the fennel, which grows so luxuriantly in the bays of our Cornish and Devonshire coasts. But besides the cabbage, the kales, and the sea-beet, there are other plants that may have come into use half in a medical, half in a dietetic, way. Such are the goose-foots, the oraches, and many kinds of cress. We may be helped in understanding the old conditions by seeing what holds now in Arctic regions, where the inhabitants find a difficulty in obtaining sufficient vegetable food. The great Polar explorer, Nansen, gives some curious information as to the food of the Eskimo. His list of their vegetable foods is very limited. He states that the old Greenlanders used to eat a number of plants, among which were angelica, dandelion, sorrels, crowberries, whortleberries, and divers kind of seaweed. The angelica was apparently eaten raw. It is one of the many Umbelliferæ that grow in vast numbers in damp places and in wonderful luxuriance on our coasts. Possibly if it were blanched like celery it might be crisp as well, as it undoubtedly is of rich aromatic flavour. It is, as you possibly know, very pleasant when candied, and lends its flavour to the liqueur Chartreuse. The Eskimo eats it as a kind of salad, well anointed with the oil from blubber. The preparation of this salad may amuse you, so I quote from Nansen in regard to it: "They also preserve the stalks of the angelica in train-oil, preparing them according to Saabye's account in the following peculiar fashion. A woman takes a mouthful of blubber, chews it and spits it out, and so continues until she thinks she has enough. When the angelica stalks have steeped for a certain time in this liquid they are taken out and eaten as dessert, with much appetite."

I adjoin another quotation from Nansen, illustrating the great need felt by these people for vegetable food: "One of their greatest delicacies is the contents of a reindeer's stomach. If a Greenlander kills a reindeer and is unable to convey much of it

home, he will, I believe, secure the stomach first of all; and the last thing an Eskimo lady enjoins upon her lover when he sets off reindeer-hunting is that he must reserve for her the stomach of his prey. It is no doubt because they stand in need of vegetable food that they prize this so highly, and also because it is in reality a very choice collection of the finest moss and grasses, which that 'gourmet,' the reindeer, picks out for himself. It has undergone a sort of stewing in the process of semi-digestion, while the gastric juice provides a somewhat sharp and aromatic sauce. Many will, no doubt, make a very wry face at the thought of this dish, but they really need not to do so. I have tasted it and found it not uneatable, though somewhat sour, like fermented milk. As a dish for very special occasions it is served up with pieces of blubber and crowberries." Scanty as are their vegetable resources, these people do not appear to suffer from scurvy. This is probably due to the fact that they eat largely of animal food, raw, or very rarely cooked, and, as far as I can find out, never salted. They eat their fish very often frozen, and they are particularly fond of the skin of various species of whale, which is taken off the animal together with the upper layer of fat, and eaten raw. Nansen says that its flavour seems to him to suggest a blending of filberts and oysters. We may suppose that a diet of this kind may, besides being rich in fats, offer some association of carbohydrates. Our imagination may carry us from the smaller animals feeding on vegetable matter, in the sea and on its floor, next devoured by various kinds of fish and crustacea, which in turn may be supposed to be the prey of larger animals, until we come to the cetacea. So far as I know, these take no vegetable food directly. They feed only on other animals. Yet they do not have scurvy. Their teeth, when they possess them, are healthy, and their skin is delicate. The contrast between this food of the Greenlander and the salted and dried fish of our forefathers is well worth remarking in relation to scurvy. We may remember also how the Gauchos of South America live almost entirely on animal food in the form of strips of dried meat, not salted, but eaten in very large quantities, as the meat is in Greenland.

In what we may call the ascending food series, from the small animals living on the bottom of the sea, or scattered through it, to the great pelagic forms, one may certainly recognise the fact that the muscular tissues are particularly rich in a carbohydrate

allied to sugar. This may be noticed in the scallop, in the crustacea, and in the rays, whose food is probably entirely animal.

Holidays are not always blessed with sunshine. Before I left the sandy bay, in which I had found so much to delight me, a mist gathered over the sky, giving rise to a halo around the sun. There were chill and dampness in the air as I made my way back in the early evening to my inn. In the night a storm of wind and rain burst upon the Land's End, utterly forbidding exit from the house. So, defrauded of the enjoyment of nature, one took to books. I had with me an old copy of the Dialogues of Erasmus, printed at Paris in 1659, and bound in vellum, an old favourite of mine. Caged in an inn I naturally turned to the dialogue entitled "Diversoria," in which two persons discourse on the ways and customs observed in the inns of France and Germany respectively some three centuries ago. The description of the German innkeeping had always delighted me extremely, and it had also interested me very much to find that Sir Walter Scott in "Anne of Geierstein" had to a large extent appropriated this dialogue. In the order of reading, "Anne of Geierstein" had preceded for me Erasmus. The vigour of the picture, as portrayed by Scott, had made the chapter which he devotes to it very attractive. Until I read my Erasmus, I had often wondered from what source he could have found his inspiration. Doubtless the passage is familiar to many of you. You will remember the weary traveller riding up to the silent inn; the grim head which is protruded from a small window, in slow response to many appeals: the silent direction as to where the horse is to be taken, and to the door at which the traveller is to enter; the sudden tortoise-like withdrawal of the head within the window. Within the inn the traveller finds himself one of a motley company in the hypocaust, or stove room, and learns that he and his fellow guests have to wait for their evening meal, perhaps for hours, until the host shall consider the company large enough to be entertained. Nothing will be served before that time. To every response or complaint there is one unfailing answer, "If this does not please you, seek another inn." The next inn was four leagues further. When after hours of waiting the evening feast was set before the travellers, it began with various kinds of soups, with bread, cakes, or grain floating in them. Wine was also provided, of truculent acidity. A grumble regarding this brought down the infallible, "*Quære aliud diver-*

sorium." The unwary and inexperienced filled themselves up with these unsatisfactory viands, and the more experienced waited the arrival of more solid dishes and more generous wines, which were freely provided. The feast ended with the introduction of a cheese, so rotten as to be kept in a sort of cage, and, as Erasmus has it, "*animalculis scatens.*" When the bill had to be paid the head waiter—"*torvus ille Ganymedes*," as Erasmus calls him—presented to each guest a score marked with chalk on a platter. It appeared that everybody paid exactly the same score, however much or however little he had eaten or drunk. After the settlement nobody was allowed to retire to his bed until the host gave the word. Scott has taken this dialogue, and, while translating parts almost textually, has dexterously woven it into the lines of his novel. It is certainly a bold bit of plagiarism. Charles Reade, in his splendid novel "The Cloister and the Hearth," has dipped into the same mine. I suppose that he had not read "Anne of Geierstein," and it is only fair to remember that "The Cloister and the Hearth" concerns the life of the father of Erasmus. In fact, "The Cloister and the Hearth" is full of passages derived from the writings of Erasmus. In comparing the adaptation of Charles Reade with that of Sir Walter Scott it appears to me that the skill of the older novelist is superior. It is something like a delicate omelette placed by the side of a beefsteak. Reade's translation is much closer: the people are brought out much more clearly, and the attributes of the cheese, probably Limburg, are presented in full relief. There is, in fact, a discussion as to how much of the cheese is really cheese, and how much cheese forming the animalcules, which is, by the way, not dealt with in Erasmus. In Reade the evening at the inn is just an episode, in Scott it is rather a telling passage in an uninterrupted story. I may add that Reade introduces the contrast between the French and German inns, greatly to the advantage of the former, portrayed in Erasmus. Scott does not let this interfere with his story. I hardly know any instance in modern times of an appropriation by two several writers of so large a passage from an earlier writer, and yet one cannot find fault with either of them. In both books the discomforts of the old German inn fall naturally into the course of the tale, and Reade, though anticipated by Scott, had a special right to the appropriation in virtue of the subject of his novel. Both writers have clearly been guilty of "plagiarism," but our

whole succession of poets and dramatists have been guilty in the same way, each one in turn "adapting," as the phrase is now, plots or passages from predecessors. What was fairly allowed to Virgil is now allowed on our stage. There is often much to while away an hour in thinking over the ancestry of many works that are better known than those from which they were derived; and, thinking again, one can see how many good old stories have been spoilt by later narrators. There are, also, doubtless, coincidences in literature which have not been consciously plagiarisms. For example, the late Mr. Anthony Trollope wrote a very clever novel, entitled "The Fixed Period." The essence of the plot was that in an Australasia of the long future a Prime Minister would pass a law according to which every citizen, after attaining a fixed age, was to be put away. Massinger has a play, "The Old Law," in which men of 80 and women of 60 are condemned to death at the same sort of "fixed period." Mr. Trollope declared to me that he had never known of this play, and I fully believe him, the general incidents being entirely diverse in the two works. Milton's famous line, in which he speaks of ambition as

"The last infirmity of noble minds,"

was, if not anticipated, at all events expressed in different words by writers of the same period. As an instance of adaptation, there is a play by Beaumont and Fletcher, called "The Custom of the Country," in which a great dramatic situation occurs, almost hidden in surroundings of unutterable grossness. The situation is that a stranger to the country, having been insulted without cause by a bullying noble, fights with him and leaves him for dead. The people rise upon the stranger, and he runs to the first open house for refuge. He finds there a lady, also noble, who receives him and conceals him. It turns out that the slain man is her only son; but, having given her oath to save the fugitive, she does not give him up to his pursuers. This episode in the play, coming down through the centuries from Boccaccio, and perhaps earlier, has been picked out by a dramatist of this century, Watts Phillips, and has been made the basis of an excellent play, called "The Huguenot Captain."

I have said that adaptations have not always been equal to the original. Dryden, for instance, appears to me to have marred in some cases the stories which he re-told. In the story of Sigis-

monda and Guiscardo, handed down from Boccaccio, while the main lines of the very tragic story are preserved, they are encumbered with unpardonable lewdness, out of all harmony with the spirit of the story, but characteristic of the methods of the man whom people of his own time, not without reason, were wont to call "Glorious John."

Now let us find ourselves out of doors again. There is a certain old town on the coast of Dorset which has afforded me numberless and yet inexhaustible rambles. It lies at the mouth of a valley, between broad chalk downs on the north-east and a great mass of oolite on the south-west. The floor of the valley belongs to the Wealden, and beyond the downs a tertiary moorland extends for miles into the interior of the country, dotted with large, lake-like expansions of a small river, reminding one of the Highlands. Within the compass of a few miles there lies before the rambler a remarkable variety of flora, and of animal life, from an abundance of land and fresh-water mollusca up to the blackcock. There one may find on the oolite the spider orchis, and the "flos Adonis" in the spring. There we may find in the valley the early purple orchis and the meadow orchis in such profusion as can hardly be matched elsewhere, mingled with cowslip and oxlip, sufficiently present to temper with their pale yellow the rich rosiness of their companions, and I have never seen the adder's tongue fern so densely massed elsewhere as in some of the meadows near the sea. There, in summer, on the downs the bee orchis and the scorched orchis abound, and later in the moorland we may find patches of the "gentiana pneumonanthe," of what is there called the Cornish heath, of the rare bog orchis, malaxis paludosa, and the bladder wort. On the sandy shore there emerges from the seemingly barren surface the already mentioned "convolvulus soldanella," with its scanty foliage and its large thick cup, streaked with delicate pink and looking almost like a choice piece of porcelain emerging from the sand. There, also, is the "sheep's scabious," exiguous in its proportions, but retaining its rich blue; and there, again, the small modest clumps of the radiola millegrana. All these are bosomed in the stiff prickly bent, which, rising everywhere, is striving to turn the shifting sandhills into some sort of solid opposition to the inroads of the sea.

There, again, as the sand has risen in embankments, little fresh-water pools have been formed, with boggy surroundings. These

are the home of the buck bean, or bog bean (menyanthes trifoliata), a plant which always seems to me to have something tropical about its character, in its large thick trifoliate leaves, and its spikes of dainty pink flowerets, with their finely divided fringe of still paler colour. It is well worth plunging knee deep into the boggy margin to obtain a few specimens of this exquisite flower. I, at least, have often done so. In the soft earth around one finds the tender bog pimpernel, contrasting strangely with the "devil's bit" scabious, the asphodel, beautiful alike in flower and fruit, the sundew, glittering and carnivorous, of which all species can be gathered, and the lesser butterwort, "pinguicula lusitanica," also probably carnivorous. Before the time of the incursion of a railway into this favourite haunt of mine I took a well-remembered walk with a companion to the nearest station, about 11 miles distant, avoiding roads, and even paths, so as to explore the country in its original state. I well remember how, coming to a dip in the land, traversed by a streamlet, I felt a great throb of pleasure on discovering a sort of hedge of the great yellow loose strife. Now this plant, which rises to a height of 3 or 4 feet with a pyramid of glorious yellow flowers, is called the "lysimachia vulgaris." It is not, in fact, a very common flower, although I have met with it in Dorset, at one end, and in the Cheviots, at the other end of England. I can hardly understand why it is not more common, seeing that it is easily cultivated in gardens. When we met with it the time was come when we might fairly take a short rest midway on what was a very tough walk, and think about it. The word "vulgaris" as applied to a plant does not by any means indicate that it is a very common thing. The term rather recognises essentially that the plant to which it is applied is the best known of its kind, mostly by reason of one or other quality attracting notice. The term has really the same sort of value as the term "officinarum" or "officinalis" bears in relation to medicinal plants. There are other lysimachiæ far more widely spread—such as, for instance, the "lysimachia nemorum," which can be found in almost any wood in the south of England; also the creeping jenny; and, on the other hand, there is one which is very much rarer, the "lysimachia thyrsiflora," a most graceful plant, growing chiefly in moist places in Ireland. The generic name of the plant had its interest for us as we conversed about it. The word "loose-strife" is, of course, a very fair translation of "lysimachia," "the stayer of

battle," yet the name is supposed to be derived from some Græco-Sicilian potentate, Lysimachus. This is not the only plant which bears the name of "loose-strife" in village wort-lore. The richly coloured spikes of the lythrum salicaria enjoy the title of "purple loose-strife." These, as you know, form in summer no small part of the glory of the banks of the Thames, and we were met by them later in our walk where it took us through a flat country traversed by numerous little dykes. Why to either of these plants has been attributed the property of stilling strife it is hard to say. While in modern botany these two plants find their places in widely separated genera, the older herbalists group them together under the head of "lysimachia," apparently because of the willow-like character of their herbage. Moreover, the œnothera was included in the same group. They seem in old times to have been gathered together around the "vulgaris" type, and the willow-like form of their leaves seems chiefly to have guided the classification. As far as I can make out their properties were limited to quieting the excitement of oxen. Gerarde writes: "Lysimachia, as Dioscorides and Pliny wrote, tooke his name of a specialle vertue that it hath in appeasing the strife and unrulinesse which falleth out amonge oxen at the plow if it be put about their yoke." If it be true that Lysimachus, the son of Agathocles, was the first finder out of the nature and virtues of this herb, it is probable that the meaning of his name found ultimately its translation into an attribution of new powers.

As an illustration of the changes which London has undergone, I find Gerarde saying that the "yellow lysimachia groweth plentifullie in moist meadowes, especially as you go along the meadowes from Lambeth to Battersey," and of the lythrum he says, "it groweth under the bishoppe's house wall at Lambeth, near the water of Thames." In fact, when I am in the museum of St. Thomas's Hospital I often think of the purple loose-strife that might have shown its virtues there now but for the intrusion of great buildings into its lowly bed. I have sometimes thought that these two plants—more or less resembling the willow, or perhaps better, the sallow, in their foliage—might have drawn their supposed peace-making qualities from their likeness to the shrub which has been in this country for years the emblem of peace and repentance at Easter-tide.

Then the walk goes on. We chat on some of the many ways in

which the naming of plants has been brought about. To revert to our first excursion, How came a "stock" to be called "matthiola"? It appears to have been called after an Italian physician, Matthiolus, who lived in the 16th century and was of great authority as a botanist. Now about eryngium. Eryngium has a much older origin, being, according to Liddell and Scott, a diminutive of ἤρυγγος. Dioscorides has discussed the virtue of this plant without, however, indicating the source of the name. The sources of the names of plants are, indeed, very numerous. Some have been given from their forms and colours; some from their uses, culinary, medical, or poisonous. A good many from supposed likenesses in them to parts of the human body, in diseases of which parts they were supposed to have a special healing value "in respect of their signatures"; such, for instance, as pulmonaria. Certain plants, flowering at particular periods of the year, have come under the dominion of the astrologer. Others, partly from their time of flowering, from their colouring, and the shape of their flowers or leaves, have been associated with the Christian religion. And many other names have come down from classic times, or have their origin lost in the unwritten lore of the country people. It is worthy of remark that in many cases plants which seem to have no botanical affinity are woven together in their naming. For instance, in our chalky districts we find very commonly the long golden spikes of the agrimony, with its beautifully fretted leaves at the base. This is called "agrimonia eupatoria," and is much used in rustic medicine. You may often see bundles of it hanging inside the doors of cottages. There is another plant, the 'eupatorium cannabinum" or "hemp agrimony," growing to a height of from 3 to 6 feet on the margin of brooks. This plant belonged to the Compositæ, and has apparently very little in common with the other agrimony, except in the name "eupatorium." Here "eupatorium" comes in as the generic name in one plant and the specific name in the other. The link cannot depend upon appearance. Both plants have been used medicinally, and both for the relief of affections of the liver. It is most probable that "eupatorium" means "hepatorium," although Pliny refers the name of "eupatorium" to Eupator, King of Pontus. As a further alliance both have had repute in the cure of snake-bite. The subject of the naming of plants offers a tempting line to follow, but time intervenes. I will only say that I have lately

read a very charming book called "Tongues in Trees and Sermons in Stones," by the Rev. W. Tuckwell, which has much bearing on this subject, and which I may commend to you as a pleasant companion on a holiday.

The walk of which I have spoken was, as I have said, taken before direct railway communication was established between my pleasant little town and the main line. A few years later I found myself approaching it by train. As, travelling through the tertiary formation, we approached the girdle of chalk down, we passed through a cutting in which was exposed a bed of white clay, topped by a stratum of mould with a surface of grass. Between the mould and the clay was a thin white layer which looked like chalk. There was evidently something unusual here, inasmuch as the chalk should have been below, instead of above, the clay. The contrast, also, between the layer of mould, at least a foot to 18 inches in depth, and the clay beneath attracted my notice, as I had just been reading Darwin's book on the "Earth-worm." My first excursion, therefore, after the day of my arrival, a pleasant walk of six miles, was made to this cutting. I soon found that the chalk was roughly broken, not rounded, as it might have been in some cataclysim from the adjoining hills, but apparently placed by human agency in a bed above the clay. Among the chalk, and in the lower part of the mould above, was everywhere abundance of broken pottery, of ancient type. Further exploration brought out the fact that the beds of clay were still being worked for use in pottery, the clay being shipped in large quantity to Staffordshire. My discovery was only a discovery for myself. I soon learned that in the workings clear evidence had been for some years obtained of the existence of a very large Roman pottery around the cutting I have mentioned. Many perfect jugs and vases had been disinterred, and the remains of old sheds and grinding stones had been exposed. On my walk back I saw in a window in the village adjoining a small Roman vase, doing duty as a flower pot. It seemed to me from the condition of the surface of the clay that all the growth of mould had taken place since the Roman labourer had bared it and formed his platform of chalk. So that here one had a sort of measure, in from 8 to 18 inches of thickness, of the slow up-building of a new stratum by the agency of the earth-worm. Each inch must have taken one or two centuries. I hardly think that I should have been attracted

as I was had it not been for the recent reading of the splendid work to which I refer.

And now, Mr. President and gentlemen, our ramble must come to an end. In this holiday we have been, I hope, enjoying nature and books, things which, I maintain, are cognate to the genius of our profession, both in its shorter and greater leisure. The pleasure which I have drawn from both in many a holiday-time will, I trust, justify me before you in the choice of my subject. And as for books, Horace has been greatly honoured of late by a great statesman. He (Horace) is a great friend of mine. I began this oration with him and I will end with him, but not in the "amatory way" of the great statesman. I am not original in choosing this quotation. Sterne, in his immortal "Tristram Shandy," pleads in these words for forgiveness for having taken the more cheerful view of the lives of men.

> Dixero si quid forte jocosius, hoc mihi juris
> Cum venia dabis.

CLINICAL EVENINGS.

November 27th, 1893.

CASE OF SYRINGOMYELIA.

By C. E. Beevor, M.D., F.R.C.P.

Dr. Beevor showed a case of Syringomyelia in a woman aged 23 years. There was wasting of both thenar and hypothenar eminences and of the interossei of the hands; the nails were brittle, and the skin was rough, dry, and hyperæmic. The knee-jerks were increased. There was no loss of tactile sensation, but sensation to pain was lost over the upper limbs, the head, neck, and upper part of the thorax. Power to distinguish heat and cold was lost over the same area.

A CASE OF CONGENITAL PEMPHIGUS.

By John R. Lunn, F.R.C.S., Ed.

Johnnie S—— was first admitted under my care on April 1, 1890.

His father died of consumption, his mother has had five other children, of whom two are dead, she has also had three miscarriages; most of the children had snuffles when they were born.

Present Illness.—Three days after birth the patient had a bullous eruption on his hands, which afterwards spread to his feet, and a large one appeared on the stomach. The bullæ sometimes suppurated, sometimes got black with blood, and, though he has attended several hospitals, his skin has never been quite clear of the rash, which at times spread to the tongue and head. When he was admitted, the whole body was covered with an eruption, more especially the elbows and knees, which were covered with large patches of loose skin with dried blood extravasated below

the surface. The treatment has been various; locally by ung. boracis seems to suit the patient best, and large doses of arsenic and iodide of potash have been given with no good result. Very often a rise of temperature occurs before the appearance of fresh attacks of bullæ.

A CASE OF FEMALE CRETIN TREATED BY THE ADMINISTRATION OF SHEEP'S THYROID.

By John R. Lunn, F.R.C.S., Ed.

Ann Nora H——, aged 25, admitted into St. Marylebone Infirmary, May 9, 1893, with all the symptoms of sporadic cretinism. Father and mother quite healthy, 13 altogether in the family, six of whom are dead, and the remainder quite well and healthy. The patient is the second youngest, and has never been sent to school. Never had a catamenial period. The urine was perfectly normal on admission and she passed thirty to forty ounces a day. No albumen. The treatment has had very little effect on the urine; she has passed even 50 ounces on several occasions, and no bad result has followed the injections, or the administration of the drug by the mouth. The thyroid extract has been given since July 7, 1893, m. xx, twice a week, and since August the patient has gradually improved in appearance and intelligence; she takes notice of what goes on in the wards, but generally prefers to play with children and their toys. In October she had her first monthly period and the last in November.

POPLITEAL ANEURISM. LIGATURE OF FEMORAL ARTERY IN SCARPA'S TRIANGLE WITH GOLD-BEATER'S SKIN.

By John R. Lunn, F.R.C.S., Ed., and Charles A. Ballance, M.S.

William W., aged 27, labourer, was admitted into St. Marylebone Infirmary, October 6, 1893, with a pulsating tumour in the right popliteal space, which he noticed six weeks before admission. No history of syphilis or blow (but thinks he strained his leg some time ago).

On admission the patient appeared to be a healthy man with no visceral disease. Behind the right knee was felt a pulsating expansile tumour, projecting some distance from the popliteal space, and evident both to sight and touch. Pulsation stopped on compression of the femoral artery, and the tumour became less on moderate pressure, gradually expanding and resuming its former condition on releasing the pressure from the femoral artery. There was a good deal of bulging on the inner side of the popliteal space, *i.e.*, enlarged bursa. Some fluid in the joint was noticed, and the leg was œdematous and swollen. From October 8th to 28th the patient exercised pressure on the femoral artery with his finger and a piece of gas piping, fitted up with a smooth round ball at one end, and weighing 3 lbs., which he had been taught to use by Mr. Lunn's colleague, Dr. Nix.

The œdema of the leg did not quite subside. On October 20, a somewhat sudden effusion into the bursal cavity behind the kneejoint occurred, leading to an extensive tense swelling in the area of the bursal sac. There was also noticed a slight redness and œdema over the tumour behind the knee. A loud bruit was heard over the aneurism.

Mr. Ballance and Dr. Edmunds kindly saw the case and noticed a swelling about the situation of the semimembranosa bursa, which Mr. Ballance described as a solid, soft swelling, and discussed the possibilities of a sarcomatous growth plus aneurism, comparing it with a case under Mr. Croft, at St. Thomas's Hospital.

Mr. Ballance, having had a large experience in ligature of blood-vessels in their continuity, was asked to tie the femoral artery. On October 20, the ordinary incision was made over the femoral artery and the vessel was tied with No. 4 goldbeater's skin ligature (which was soaked in carbolic oil). A long piece of ligature was used and threaded through the needle to its middle, so that when the needle was withdrawn two ligatures were lying under the artery. A stay knot was then tied. The pulsation in the tumour and arteries of the leg ceased at once, and it was noticed that the knot of the ligature travelled a distinct distance at each pulsation away from the heart, the second hitches of the stay knot were tied, as in a single reef, by Mr. Ballance.

The patient made an uninterrupted recovery, the wound was dressed on the third day, and was quite healed. His tempera-

ture went up 101° F. on the second, and afterwards remained normal. On the 5th day after the operation, the bursal effusion had disappeared, the patient did not suffer any pain, and the right leg remained as warm as the left. No pulsation in the tibials had reappeared, the aneurism seemed much firmer and harder.

The patient was kept in bed five weeks and was never allowed to put his foot to the ground. About two weeks after the operation the tumour began to get soft and fluctuating, resembling a hæmatoma, and is still in the same condition; the patient now gets up in a wheel chair, and is taking a mixture of iodide of potash and iron. If, after some weeks, the tumour does not subside he proposes cutting into the swelling and treating it as an ordinary hæmatoma.

Mr. Ballance pointed out that the interest of the case lay in the difficulty of diagnosing whether it was simply an aneurism or an aneurism complicated with a tumour, as in the case recorded by Mr. Croft, in the Clinical Society's Transactions, about three years ago, in which the concomitant tumour proved to be a sarcoma. He supposed, however, that the present fluctuating swelling was a collection of blood in the aneurismal sac, but as it was only six weeks since the operation, he thought it would be preferable to leave it awhile, especially as such sacs sometimes take some time before they definitely disappear. He referred to a specimen of an aneurism in the museum of the College of Surgeons in which John Hunter tied the femoral artery fifty years before the death of the patient, and even after that lapse of time a fibrous nodule remained in the popliteal space. At the same time as the swelling would prevent the man using his knee and from following his occupation, they had decided to operate further should it not subside under rest and pressure in the course of two or three months. He remembered a precisely similar case when he was dresser at St. Thomas's Hospital, in which Mr. Sidney Jones had intervened successfully in the manner described. He used a ligature of goldbeater's skin tied in a "stay knot." The coats of the artery were not divided. The ligature and the knot, which were, he thought, superior to all others for this purpose, were described by Mr. Edmunds and himself, in their book entitled "Ligation in Continuity." (*Note.*—The popliteal swelling not disappearing, it was incised, the clot turned out, and the cavity filled with iodoform gauze. The wound rapidly filled up and healed. Flexion of the kneejoint (the popliteal swelling having been removed) then became possible, and in a short time the limb was as useful and as sound as ever.)

CASE OF OBSTRUCTION OF SUPERIOR VENA CAVA.

By Sir Hugh R. Beevor, Bart., M.D.

Sir Hugh Beevor showed a man, aged 41, who presented tortuous dilated veins from mammary to inguinal region, first noticed 15 years ago. The current of blood was downwards. The patient

found that after stooping he suffered from dyspnœa and a sense of constriction in the throat, his face becoming intensely congested at the same time. He ultimately became unable to follow his employment—a sorter of deals. No evidence of disease could be detected on auscultation or percussion. He had had syphilis. He referred to a case in which a man, with a history of recent syphilis, had developed obstruction of the superior vena cava as the result of syphilis (gumma) of the mediastinum, reported by Dr. Seymour Taylor and by Dr. Bristowe.

Dr. F. Roberts (the Vice-President, in the Chair) admitted that it was a very puzzling case. He himself had seen a few cases of obstruction of the superior vena cava, and he referred to one in particular in a man the upper part of whose body was swollen and intensely cyanosed, together with his arms, neck, face, and head. He died with practically no other symptoms than intense cyanosis. *Post-mortem*, a dense mass of fibrous tissue was found surrounding the vena cava, which it completely occluded. There was no history of syphilis. The man was employed at the Woolwich Arsenal. He did not think that the evidence of obstruction of the vena cava was clear in the case before them. He mentioned another striking case in which the patient had an aneurism of the aorta, which ruptured into the vena cava, giving rise to a curious medley of auscultatory and other physical signs, in addition to the cyanotic condition. The doctor who was called to the case was naturally enough somewhat puzzled to make out what it all meant.

CASE OF HYDATID CYST OF THE BLADDER.

By E. Hurry Fenwick, F.R.C.S.

Mr. Hurry Fenwick showed a man, aged 30, from whom he had removed a large hydatid cyst, which was situated between the muscular layer of the posterior wall and the peritoneal covering. He remarked that these cysts in the *male* pelvis were extremely rare, only 50 cases being found in the literature for the last 200 years. The case in point was the third which had come under his care. The *post-mortem* preparations from the first two were exhibited, and in each the exact position of the hydatid cyst was clearly seen. Both had been shown at the Pathological Society in 1886 and 1891. In the second case a man, aged 20, was seized with sudden suppression, and a large pelvo-abdominal cyst was discovered. Some of the fluid contents was drawn off by aspiration through the rectum, and the bladder, which had previously been found to be empty, then filled with urine, and the suppres-

sion was temporarily relieved. At the autopsy the kidneys were found to be mere bags, and the ureters greatly dilated. The lessons which were learnt from the first two cases were—1. The insidious nature of the backward renal pressure exerted by the cyst on the ureters as they crossed the pelvic brim. 2. The slightest reduction in the tenseness of the cyst permitted the ureters to empty their dammed-up contents into the bladder. 3. The ease with which these bladder cysts can be attacked suprapubically, for they are entirely extraperitoneal.

In the case exhibited, he reached the cyst in this way, but had to dislocate the bladder to the left and draw the cyst forward. 34 ounces of fluid were removed and 10 ounces of daughter cysts.

As the fluid was withdrawn from the cyst the bladder was seen to fill. The patient made an uninterrupted recovery.

Mr. Sheild said he had seen one such case whilst at the Cambridge Hospital. The patient was brought in with retention of urine. A catheter was passed, but only drew off a small quantity of clear fluid. On withdrawing the catheter the man expelled *per urethram* a hydatid vesicle, after which it was found possible to introduce the catheter into the bladder. A tumour, however, still remained, so they cut down through the peritoneum, and evacuated a number of cysts and a large quantity of fluid. The case was under the care of Mr. Edmund Carver.

Mr. Ballance referred to a similar remarkable case under the late Dr. Murchison. The patient was admitted to St. Thomas's Hospital with a tumour in the abdomen situated in the mid-line above the pubes, which it was at first thought might be a distended bladder. A catheter was therefore passed without emptying the tumour; its limits, however, became more clearly defined, and the hydatid thrill could be distinctly perceived during rectal examination, so it was aspirated above the pubes, and a large quantity of hydatid fluid was withdrawn. The patient recovered, and had since remained perfectly well. Previous to admission there had been difficulty of micturition, and for some days very little water had been found. The bladder was empty when the aspiration commenced, but as soon as the fluid was drawn off a considerable quantity of urine found its way into the bladder. This supported the author's conclusion that these cysts might dam back the urine, and prevent it entering the bladder.

SEQUEL TO A CASE OF EXTRAORDINARY CONGENITAL TUMOUR IN AN INFANT.

By A. Marmaduke Sheild, F.R.C.S.

Mr. Marmaduke Sheild showed a specimen of a large congenital tumour removed *post-mortem*, which case, with an illustration, was reported on p. 360, 'Trans. Med. Soc., London,' vol. xvi, 1893. The

tumour was found to have no definite boundaries towards the axilla or the root of the neck. It pressed deeply beneath the clavicle, and the subclavian vessels traversed its substance. In September, 1893, the tumour, from no apparent cause, underwent spontaneous inflammation, increased enormously in size, and became hot, red, œdematous, and finally livid and congested in parts. Aspiration in places only drew away a little bloody serum. Notwithstanding careful nursing and stimulation, the child succumbed to fever and exhaustion in three weeks. The tumour was composed of dense connective tissue and fat throughout its main bulk; but towards the axilla and the root of the neck this tissue merged by insensible gradations into sponge-like growth, and finally into distinct cysts the size of peas or grapes filled with yellow, serous fluid. The tumour had been microscopically examined by Dr. Rolleston, who reported as follows:— "The growth is composed of a number of small cavities, the walls of the cavities are composed of well-formed fibrous tissue, enclosing in many places well-developed fat cells; the vessels are well formed. There is, at the edge of the piece taken, an area showing a dense small, round cell infiltration, probably a small abscess. The cavities show neither epithelial nor endothelial lining. The contents of the cavities are granular, homogeneous, or fibrillar, the appearance varying; in a few places some small round cells can be made out. There is no evidence of its being malignant." This tumour would seem to belong to the class of cystic hygroma, with more connective tissue than usual. The *post-mortem* examination well illustrated the fact that these formations, however superficial they might appear to be, invariably extended beneath the deep fascia, where they primarily originated. In another case successfully operated upon by Mr. Sheild, and reported with an illustration in the 'Lancet' of January 7, 1893, the congeries of cysts extended beneath the deep cervical fascia from the hyoid bone to the mediastinum, though the growth at the outset of the operation seemed to be quite superficial. Sarcomatous tissue was sometimes mingled with these growths, and they then showed a definite malignancy. Spontaneous inflammation was the ordinary fate of cystic hygromata, and was prognosed in this case. The process was curative, and might result in shrivelling if the patient could withstand the inflammatory fever and exhaustion.

A CASE OF ENLARGED BLOOD-VESSELS OF THE SKIN OF THE FACE OBLITERATED WITHOUT SCAR BY ELECTROLYSIS.

By Balmanno Squire, M.B.

Dilatation of the venous radicles of the skin of the face is a very common disfigurement. It is often associated with acne rosacea; but it sometimes occurs independently, as in the present case. These *teleangiectases* occur on the nose or cheeks. In this case they are extensive on the nose and on both cheeks, and are exceptionally well marked. This condition is not infrequently associated with a profusely oily condition of the face and a dilatation of the orifices of the sebaceous follicles, which may be described as seborrhœa oleosa. Teleangiectasis of the face can only be regarded as a degeneration; it is a varicose condition of the minute veins; although commoner in middle-aged and in elderly persons, it is to be met with occasionally in young adults and sometimes in children. Habits of intemperance are sometimes imputed to those who suffer from this condition. Until recently nothing could be done to remedy it. But the method of multiple punctiform scarification, devised by Braunscheid for the treatment of lupus, and subsequently adopted for that disease first by Dubini, of Milan, and then by Volkmann, of Halle, led indirectly to a means of dealing with this condition. The punctiform scarification was done with needles like sewing needles, and was therefore of no service in the obliteration of teleangiectases—nor, indeed, was it ever suggested that it could be. Volkmann, in pricking skin affected with lupus, used the point of a lancet. This plan I found to be more or less efficient. The first puncture bled so that precision in the puncturing was out of the question. I found that at some parts the punctures were so close together that the skin was finely minced, whilst at others they were too scanty.

I succeeded, by a modification which is now commonly known as multiple *linear* scarification, with a scarifier which makes a number of parallel and equi-distant incisions corresponding in depth to the thickness of the skin. I used the same instrument for obliterating, without scar, teleangiectases of the face, the in-

cisions being made, of course, much more shallow than in cases of lupus. It answered admirably, and I have since frequently used it for this purpose with excellent results. Recently I tried the electrolytic needle on my own nose, which had begun to develop teleangiectases on its surface. I succeeded quite to my own satisfaction, and have since tried it on other cases with excellent results. I find, however, that I was not the first person to whom this idea had occurred, as electrolysis had been previously thus applied in America by Dr. Hardaway, of St. Louis, and Dr. G. H. Fox, of New York.

In the case now brought forward only the left half of the face has been operated on, and the result is satisfactory. The patient's complexion, which is rather a wreck on the right side of the face, is completely restored on the other, which was not the better of the two at the start. From four to eight small Leclanché elements have been used to generate the current. The needle used was an ordinary No. 12 sewing needle, and the patient attended 12 times. Precision in execution is necessary, as each of the little blood-vessels has to be accurately touched with the needle point. As it is only necessary for the needle point to just enter the surface of the skin, the operation, though uncomfortable, is not painful to the patient. The procedure is not better than multiple linear scarification, but the results are equally satisfactory. It also takes much longer to perform, but is less alarming to a timid patient. It requires less skill on the part of the operator to avoid leaving minute permanent traces of the operation, and it is far more easy to do in special situations like the bridge of the nose. The current also must be carefully applied, as, if it be too weak or the needle too quickly withdrawn, obliteration does not result; if the current be too strong, or if the needle be not withdrawn quickly enough, or if it be inserted too deeply, a minute scar will be left at each puncture; and this, when several hundred punctures occur within a small area, is apt to lead to untoward results.

RECOVERY FROM LATERAL SINUS PYÆMIA.

By Charles A. Ballance, M.S.

Mr. Ballance showed a man, aged 20 years, who was admitted to St. Thomas's Hospital at the end of last September with

typical symptoms of lateral sinus pyæmia of eight days' duration. He was drowsy; temperature 105·5, fœtid otorrhœa, and swelling over the upper part of the internal jugular vein, and over the mastoid process. Mr. Ballance at once operated, and found the petrous and mastoid bones carious. He exposed the sinus, but found no evidence of thrombosis, so he cut down on the jugular vein just below the parotid gland, but as it was thrombosed at that point he made another incision in the neck and tied it close above its junction with the subclavian vein. He then enlarged the opening in the bone and made a free incision into the lateral sinus, which was not clotted, bled freely, but was easily plugged with a strip of iodoform gauze. He pointed out the interesting fact that the sinus was not blocked in the usual place, but that probably the thrombosis commenced near or at the jugular foramen. The operation was followed by a rapid and uneventful recovery.

OPERATION FOR DUPUYTREN'S CONTRACTION.

By Charles B. Lockwood, F.R.C.S.

Mr. Lockwood showed casts of the hands of a man who came to him with Dupuytren's contraction of the palmar fascia in both hands—and the man himself, in order to demonstrate the results of operative procedure. The ring finger was mainly affected in the right, and the little and in part the ring finger in the left, both being tightly fixed upon the palm. The patient was markedly gouty, but in spite of this Adams operation had been performed by multiple punctures with subsequent forcible straightening of the fingers. The results, as he was enabled to show, had been highly satisfactory.

REMOVAL OF LARGE DIFFUSE LIPOMAS OF BACK OF THE NECK.

By Charles B. Lockwood, F.R.C.S.

Mr. Lockwood also showed a man, aged 45, from whom he had removed two large diffuse lipomata from the back of the neck. This involved a very extensive operation, but with satisfactory results. The hæmorrhage had not been troublesome, and the wounds healed by first intention.

CASE OF SKIN-GRAFTING FOR LUPUS.

By W. Watson Cheyne, F.R.C.S., F.R.S.

Mr. Watson Cheyne showed a lad whom he previously showed on the occasion of Mr. Bruce Clarke's paper on skin-grafting for lupus in March, 1893. In this case he had excised the lupus, which covered both cheeks and the nose and also the back of one hand, and covered the surface completely with skin-grafts. Four small nodules of recurrence were found on a part which had been done 18 months previously, but nowhere else on the area covered with skin-grafts. A small patch of recurrence was present on a part which had been scraped and cauterised, but not excised.

Mr. Ballance referred to a case in which he had removed a lady's breast for scirrhus. Much skin had to be taken away, and the flaps could not be brought together. The interval between the flaps was entirely covered by Thiersch's grafts. These all lived, and the wound healed at once. This year, however, the patient had returned, and he had found that the whole graft area had taken on a cancerous growth. That appeared to him somewhat remarkable, especially as it had been suggested that the transplantation of such grafts might be the means of delaying or preventing a recurrence.

CASE OF (?) BAZIN'S DISEASE.

By Alfred Eddowes, M.D.

Dr. Alfred Eddowes showed a case presenting many of the features of Bazin's disease.

The patient was a tall, somewhat delicate-looking girl, aged 14, subject to cold hands and feet, was fairly well nourished, and had a good family history.

There was no reason, beyond the impression which might be gained by a hasty glance at the wounds, to suspect syphilis. The lesions had been confined to the legs below the knees, and were all now soundly cicatrised. When the patient first came under observation, both legs and thighs were covered by horny concretions projecting from the mouths of the follicles, which, in some instances, were so firm and pointed as to hurt the tip of a finger pressed upon them. So striking was this feature as to suggest the possibility of its being a case of Darier's disease.

Remaining in the scars were many double comedomes, underlying little bridges of true skin. Special attention was drawn to the distribution of the scars. The fronts and backs of both legs were symmetrically affected, whereas the inside of the one matched the outside of the other, and *vice versâ*, producing what Dr. Eddowes called "stocking symmetry." This false symmetry he considered was due to infection by interchange of stockings soiled by discharges.

The diseased process appeared to him to be as follows:—

1. Lichen pilaris.
2. A patch of erythema caused by a group of slowly ulcerating follicles opening into each other, honey-combing the skin and leading to absorption of the cellular tissue.

He was disposed to look upon it as an acne or folliculitis of a scrofulous nature (rather than syphilitic) upon a very vulnerable patient. There was ample evidence that the disease was not due to infection with the organisms which produce common acne or impetigo.

CASE OF LINEÆ ATROPHICÆ.

By W. Pasteur, M.D., F.R.C.P.

Dr. Pasteur showed an unmarried woman, aged 32 years, who had large numbers of lineæ atrophicæ in various parts of the body. About two years and a half ago she became very much stouter, and noticed the formation of reddish streaks, which had, since then, become gradually paler. Many of the streaks were of considerable width, pinkish or bluish in colour, and becoming pearly-white in places. The parts most affected were the lateral aspects of the buttocks, the inner sides of the thighs, and the anterior and posterior folds of the axillæ, and, to a less extent, the breasts, lower abdomen, and upper part of the calves. The skin was quite thin and atrophied over the affected areas, which were indistinguishable from the lineæ albicantes following pregnancy.

January 22nd, 1894.

REMOVAL OF RUBBER TUBE FROM THE BLADDER.

By A. Pearce Gould, M.S.

Mr. A. Pearce Gould showed a piece of rubber tubing 11 inches in length, of the calibre of No. 17 French catheter scale, removed from the bladder of a draper's assistant. The patient stated that believing he had contracted gonorrhœa, he had been advised to introduce a tube for the purpose of making a deep injection into the urethra. He was disturbed just as he had introduced the tube, and abruptly concealed what he was doing. Later he found that the tube had disappeared. It could be seen by means of the cystoscope lying in the bladder, and was withdrawn without much difficulty by the lithotrite.

The Chairman (Mr. Swinford Edwards) mentioned a case in which the diagnosis of the situation of a piece of grass in the bladder had been made out by the aid of the cystoscope, thus enabling the operator to withdraw the foreign body with a lithotrite.

Mr. Hurry Fenwick said the most difficult case of extraction of a foreign body by means of the lithotrite occurred in a gentleman, aged 21, who had been sent to him by Dr. A. E. Younger. The patient had passed a stout piece of paraffin-wax taper, $2\frac{1}{2}$ to 3 inches long, into his urethra, and it had slipped from his grasp. The taper could be seen by means of the electric cystoscope floating at the apex of the bladder, oscillating at every respiration, and hugging the wall in such a manner as to render it almost impossible to seize it with the lithotrite. It was brought within reach by half filling the bladder with air, by elevating the pelvis, and by noting the direction in which the axis floated by means of the cystoscope. By keeping the patient perfectly quiet, he had succeeded in seizing it near one end, and in withdrawing it whole. The extraction only involved some slight laceration of the canal.

TWO CASES OF TRANSVERSE FRACTURE OF THE PATELLA TREATED BY LISTER'S OPERATION.

By Charles A. Ballance, M.S.

Mr. Ballance showed two men who were admitted to St. Thomas's Hospital three months ago with transverse fracture of the patella. He had adopted the treatment recommended in 1883 by Sir Joseph Lister, now a well recognised operation. In one

man the movements of the knee joint were very free, and no ridge remained to indicate the position of the wire. He called attention to the fact that the incision had been made on the outer side of the joint in order to avoid the formation of a cicatrix over the front of the knee cap. The other patient had apparently been afraid to move the joint, and consequently some impairment of movement was present. This, however, it was hoped could be remedied by taking him into the hospital again for a week or so. A ridge could be felt indicating the site of the wire used in wiring the patella. He had not used a drainage tube in either case, though this was part of the operation as originally proposed by Sir Joseph Lister. He had not employed the drainage tube in any of the six or seven cases upon which he had operated by this method. There had been uninterrupted recovery in all the cases without any rise of temperature. He pointed out that all other methods of treatment failed to provide for the removal of the aponeurosis and clots which in most cases prevented the approximation of the fragments. Some years ago he had seen several joints opened by this method, and in every case there must necessarily have resulted a separation of from a quarter to half an inch in consequence of the displacement of the aponeurosis, &c., between the fragments, unless the joint had been freely exposed by Lister's method. He had never had any trouble with the wire. In only one case had the temperature exceeded 100° F., and this proved to be due to some ulceration of the buccal mucous membrane, probably due to the use of a leaky Clover's inhaler. In respect of the actual operative treatment, he was of opinion that everything should be done exclusively by the operator in order to minimise the risk of infection. He himself never employed any assistant. He washed out the joint with a 1 in 1,000 solution of perchloride of mercury, taking, of course, the usual precautions to secure personal asepsis. He thought passive movements might advantageously be commenced at the expiration of 10 days or a fortnight, and the splint ought to be discontinued then or even before. The wound always healed by first intention, and the patients were able to walk about the wards at the end of a month.

Mr. Turner observed that the operation was formerly recommended as most suitable for old ununited fractures, but he held that it was essentially the operation for recent cases where there was no tension on the fragments and no reviving to be done. He agreed that the practice of making the

incision on one side was good, because the presence of the cicatrix in front of the joint might, under certain circumstances, give rise to trouble. He referred to a case of a man who came to him with suppuration of the knee joint consequent on a fall after a previous operation for wiring the patella. The end of the wire had apparently penetrated the cicatrix, and so converted the fracture into a compound one. He urged that some other substance than wire would be preferable if it possessed the requisite strength. He had tried kangaroo tendon, but it lacked the necessary strength. Although there were many modifications and plans of operating on fractured patella, he said that no operation gave such excellent results as Lister's method when it succeeded.

Mr. Watson Cheyne said he was glad to find that the practice of wiring in cases of fractured patella had become general, because the students at King's College might then hope to meet with a better reception at their examinations when they ventured to suggest wiring as the method of dealing with such cases. This was the only plan resorted to at King's College. Union would probably be obtained whatever substance was employed to bring the fragments together, provided the fragments were placed in apposition without any foreign material between them ; but the advantage of using thick wire was that one could allow the patient to walk about early and so avoid stiffness without fear of separation of the fragments, and this would not be the case with catgut or tendon. He himself removed the splint at the first dressing, *i.e.*, on the 10th day. Then voluntary movements in bed were enjoined, and within three weeks of the operation the patient was told to get up and walk about. He had not found it necessary to do anything in the way of passive movement. He did not think that any plan of dealing with these cases without opening the joint, could be attended with success in the vast majority of instances. Of the cases in which the joint had been laid open he did not remember one in which it would have been possible to bring the bones in close apposition on account of the torn periosteum and fascia falling in between the fragments. He agreed that it was a serious thing to leave the patient with a cicatrix in a position where, in the event of subsequent injury, the fracture would run great risk of being made compound.

Mr. Bruce Clarke said he had done the operation a great many times, but he was not in the habit of letting the patients get about as soon as other surgeons seemed to do. His prudence in this respect had been induced by a case he had under his care some years previously—that of a guard on the Metropolitan Railway. Within six weeks of the operation he had actually returned to his work, and one day he was found in his van with a compound fracture into the joint of the knee cap. He came under the care of Mr. Godlee, who washed out the joint and wired it anew, and he was soon again on foot, and was now doing his work on the Underground with an excellent joint. Since that time he had preferred to wait six weeks before allowing much movement. He generally used the vertical incision, but in the particular case referred to he had made the incision transverse, which doubtless contributed to the wound being compound on the occasion of the second accident.

Mr. Leonard Bidwell referred to the case of a patient who had been treated for fractured patella by subcutaneous operation. He made a good recovery, and went back to work. Six months later he slipped and broke the patella afresh, and was admitted to the West London Hospital. He opened the joint at once by a lateral incision, and found the piece of wire sticking between the condyles of the femur, which he removed. The

fragments had never united at all, but had been held together by the wire. He resected the edges of the bony fragments, and the man made a good recovery. He did not think that the splint should be kept on longer than a fortnight at the outside, but he generally left the patients to kick about in bed for another three weeks.

MYCOSIS FUNGOIDES.

By Morgan Dockrell, M.D.

F. H., aged 48. Father died, aged 68, of malignant disease in throat. Mother died at 62 of bronchitis. Brothers are living and in good health. Sisters, two living, in good health.

Previous History.—9 years of age, carbuncular neck; 15 years of age, gonorrhœa; 18 years of age, gastric fever; 26 years of age, carbuncle of neck; 28 years of age, congestion of lungs. At 40 years had a rash on chest, which got speedily better. At 41 years he had a dry, scaly, and very irritable eruption, general in distribution, presenting well-marked localised patches of epidermic accumulation at elbows and knees, somewhat symmetrical. At 42 he rubbed one of the patches into an open sore, which has never completely healed; this is situated below right arm. When 44 years old he got similar trouble from rubbing in the right lumbar region; the place when first noticed was the size of a five-shilling piece: this has never healed, has enlarged, and is fungating. During this time the patient's health was good.

On admission to St. John's Hospital, patient was cachectic and somewhat debilitated. He was covered with a dry, scaly, exfoliating dermatitis, some patches presenting the features of an ordinary psoriasis.

Right lumbar region, and situated between the lower ribs and the crest of the ileum, is a raw, oval, fungating mass; granulations are large, coarse, flabby, and bleed when touched.

Just below elbow on the outer side of the right arm is a circular punched-out-looking ulcer of six years' duration, the base and sides are covered with fine granulations and bathed in healthy secretion, with no tendency to fungate.

Points of Interest.—1. The well-marked patches of erythema, with the persistent itching.

2. Disappearance of itching and pain recently, when tumour stage was entered.

CORNUAL GROWTH IN THE PENIS.

By W. Bruce Clarke, F.R.C.S.

Mr. Bruce Clarke showed a man who had undergone circumcision in his out-patient department seven months ago. At that time there was no trace of any growth of the kind, but subsequently a cornual growth had sprung from the left posterior margin of the prepuce, which at present measured some 2 inches in length and was curved on itself.

Mr. Marmaduke Sheild suggested that the growth had probably started from some implantation of wart epithelium at the time of the circumcision. The man apparently dated the commencement of the growth very clearly from the operation. He pointed out that a similar growth often followed ulceration of a sebaceous gland, and also of ulceration of molluscum contagiosum. Moreover, cysts of some size were sometimes met with, consequent on the implantation of epithelium in the fingers by pins and needles.

ULCERATION OF THE LIP OF DOUBTFUL NATURE.

By George R. Turner, F.R.C.S.

Mr. Turner showed a man, aged 41, who presented an ulceration of the lip of three months' standing. There was also a lump under the angle of the jaw. The question was whether it was syphilis or cancer. The patient had already been under anti-syphilitic treatment, apparently without benefit, but a course of this treatment had resulted in so marked an improvement in the appearance of the ulceration that he was inclined to believe that it might turn out to be syphilitic, in spite of its unpromising appearance. He asked for an expression of opinion as to the diagnosis.

The Chairman pointed out that the history of the case was short for an epithelioma of such a size. He thought, moreover, that the glands were not enlarged to the extent that they would have been had the ulceration been epitheliomatous.

EXFOLIATION OF THE ENTIRE MUCOUS MEMBRANE OF THE BLADDER.

By E. Hurry Fenwick, F.R.C.S.

Mr. Hurry Fenwick showed a specimen obtained from a patient operated upon by Mr. Heycock for acute exfoliating cystitis by perineal cystotomy. The entire mucous membrane of the bladder was withdrawn through the perineal opening as a white phosphatic necrosed mass. On the outside of the slough strands of the muscular layer of the bladder could be seen. The patient, now 53 years of age, had suffered from difficulty of micturition for 25 years, but no impediment in the form of stricture or enlarged prostate could be found. He recovered completely (patient shown), and was at present able to hold his water for an hour and a half. He mentioned that 33 cases of exfoliation of the mucous membrane of the bladder, due to accidents in the puerperal state, had been collated by Haultain, but only 20 cases from other causes (Brisson). The case was important, as showing that even large masses of the mucous membrane might be removed in operating for vesical tumours.

The Chairman referred to the case of a man admitted for increased frequency of micturition, together with a certain amount of hæmaturia and recurring attacks of retention. He was sounded for stone, but none was found, so median perineal cystotomy was done, and he had fished out a cast of the bladder wall, a distinct sac, of a dirty wash-leather substance coated with phosphates. The patient did very well, though the convalescence was rather prolonged. He could now hold his water for an hour.

Mr. Fenwick, in reply, dissented from the view that the Chairman's case was analogous to his own. He pointed out that exfoliation might take place in several ways: (1) in consequence of so-called membranous or diphtheritic cystitis with lymph formation, large flakes of which came away in the urine; (2) exfoliation of the mucous membrane, caused by the burrowing of tuberculosis, thus separating and causing sloughing off of surface patches; and (3) entire casting off as a slough of the mucous membrane, including muscular fibres, of which the case he had just shown was a typical example.

PERFORATION OF THE PALATE, PROBABLY SYPHILITIC.

By W. Pasteur, M.D., F.R.C.P.

Dr. Pasteur showed a man, aged 43, who had been under observation many months with aortic regurgitation. About three months ago he suffered slightly from sore throat, and said that something had given way in his throat. Since that time his voice had acquired a somewhat nasal snuffling quality. The throat, when first examined a fortnight before, showed a small healed perforation of the soft palate on the left side, about $\frac{1}{3}$ inch from the summit of the left faucial arch, and on the level of the base of the uvula. There was a small scar on the centre of the uvula. Twenty-three years before this patient had had a urethral discharge, lasting a few weeks. Beyond this there was nothing in his past history, both before and after marriage, to suggest syphilis, nor did a careful examination reveal any traces of this disease.

Dr. Pasteur wished to know whether, under these circumstances, it would be justifiable to diagnose the lesion as of syphilitic nature.

CASE OF ECTOPIA VESICÆ.

By Albert Carless, M.S., F.R.C.S.

A bridge of scrotal tissue, 2 cm. in width, was first dissected up by making two parallel incisions below the redundant prepuce, under this the penis was passed, and subsequently secured by uniting the margins of the gap by a row of sutures. An incision was made vertically upwards on either side of the exposed mucous membrane, united above by a horizontal cut, so that a quadrangular flap sufficient to cover in the defect could be turned down. The free end of this flap was passed under the scrotal bridge and sutured to it, whilst the sides of the flap were most accurately united to the skin left on either side of the exposed mucous membrane. Two rows of sutures were here inserted, one to unite skin to skin, and another to cover the edges of the skin with subcutaneous tissue. Special care was directed to the suturing of the corners of the flap under the scrotal bridge so that

no exposed portion of subcutaneous tissue should be left. The abdominal integuments, which had been previously raised from the muscles, were now drawn over, secured by three deep button sutures on either side, by a continuous suture in the middle line, and by interrupted sutures to the upper border of the scrotal bridge. A large tube was inserted into the new bladder, and arrangements made for drawing off the urine.

Unfortunately primary union did not take place, but the superficial abdominal flaps broke away from the newly-formed bladder, and considerable suppuration ensued. No urinary extravasation, however, occurred, and, as soon as healthy action was established, the exposed and granulating surfaces were grafted by Thiersch's method, leaving the condition now shown.

ANKYLOSIS OF THE JAW FOLLOWING INFLAMMATION OF THE LEFT TEMPORO-MAXILLARY ARTICULATION. RESECTION OF THE CONDYLE. CURE.

By C. Stonham, F.R.C.S.

J. B., aged 7. When 1 year 4 months old she had abscesses about the hip (L.), the L. elbow, the lips, and the mouth.

The abscess in the mouth is said to have discharged through the left ear, but the history is in many respects very deficient. When the discharge from the ear ceased it was noted that there was gradually increasing difficulty in opening the mouth.

She came under my care in September, 1893. At this time she could not open the mouth more than $\frac{1}{3}$ inch, and could only take fluid food.

On September 27 I cut down on the neck of the condyle, and removed it. There was a good deal of oozing, and the wound was packed with gauze, which was removed in the morning and the wound sutured. On October 4 the sutures were removed, and by the 14th the wound was completely healed. For the first 10 days fluid food only was given.

In the first week she was fed through a tube, and the mouth was kept closed. At the end of this time she could open her mouth to the same extent as at present without any pain.

She can now eat anything.

TRAUMATIC FISTULA OF PAROTID DUCT.

By C. Stonham, F.R.C.S.

W. L., aged 8. Fell off some wooden steps about 10 feet from the ground, and cut cheek on the spike of a railing, end of August, 1893. The wound partially closed, but a small opening has remained. Through this there is a discharge of saliva. The wound is situated close to the point where the duct opens into the mouth.

April 16th, 1894.

TWO CASES OF RETAINED TESTIS PRESENTING POINTS OF SPECIAL INTEREST.

By C. B. Keetley, F.R.C.S.

Mr. Keetley showed two patients to demonstrate a method of retaining the testis after drawing it down out of the inguinal canal. The inguinal canal is, if necessary, cut up and the testis separated from its adhesions and brought down. Two skin wounds are made in the scrotum and adjacent thigh respectively, and the wounds are then sutured to the fibrous tissue always found attached to the testis or epididymis, the sutures being made to traverse the tunica vaginalis. In one of the cases he had left the testis fixed to the thigh in this position for five months without any inconvenience. It was shown still attached to the thigh. In the other case it was left attached for a month only. In both cases an operation for the radical cure of hernia was performed at the same time, and, in one, an umbilical hernia was operated upon.

Mr. Swinford Edwards observed that the testicle in the elder patient was markedly atrophied, and he asked if the author was of opinion that this condition was likely to be recovered from. On the face of it this did not appear likely, and if this were so he asked whether it would not have been a more satisfactory operation to remove the organ at the same time.

The President pointed out that the lad was under the impression that the testicle had enlarged since the operation. In view of the interest that attached to this question, he suggested that it might be settled by the author if he would bring the patients before the Society two or three

years hence, by which time they would be in a position to form a definite opinion as to the future in these cases.

Mr. KEETLEY, in reply, observed that both the patient and himself were under the impression that the atrophied testicle was growing. He added that there was positive evidence to show that retained and atrophied testicles were not always functionless, especially when they were brought down in early life. Moreover, the operation of bringing down the testicle was a trivial complication of that for radical cure of hernia which was almost always required in these cases.

A CASE OE LEFT INGUINAL COLOTOMY FOR INTESTINAL OBSTRUCTION; SUBSEQUENT REMOVAL OF BAND CAUSING THE OBSTRUCTION; CLOSURE OF THE COLOTOMY OPENING THREE YEARS AFTER FIRST OPERATION.

By D. H. GOODSALL, F.R.C.S.

MR. GOODSALL exhibited a patient, a female aged 27, who had suffered from intestinal obstruction; left inguinal colotomy was performed, and three years later, the cause of the obstruction having been removed, the colotomy opening was closed. He first saw the patient in consultation with Dr. G. T. Penny on December 19, 1890. Her illness had lasted for 10 months. At first she was treated for ovaritis (right side), later for fibroid of uterus, and in November, 1890, for pelvic cellulitis or abscess. When he saw her the bowels had not been relieved for 18 days; there was and had been constant vomiting for 48 hours, with very severe pain in the lower part of the abdomen. The rectum was empty; the abdomen was not distended with flatus. The transverse colon and the sigmoid flexure were dull on percussion, but the right iliac region was resonant. Hard fæces could be felt in the transverse colon. On December 20, 1890, the patient was admitted into the Metropolitan Hospital under his care, and left inguinal colotomy was performed. The sigmoid flexure was so full of hard motion that it could not be brought through the abdominal incision. Its front surface was therefore sutured to the sides of the incision. Twenty hours later the colon was opened by a longitudinal incision about 1 inch in length; the sides of this opening were drawn out and sutured to the skin about $\frac{1}{2}$ inch outside the upper and lower border of the abdominal incision. The bowels acted through the opening and the vomiting ceased. On the following day, December

21, fæces passed into the rectum as well as through the colotomy opening. In June, 1891, the first attempt was made to close the opening into the colon, but failed, as did two other attempts because of the sickness caused by the anæsthetic. On October 17, 1893, an exploratory examination was made to find out the cause of the intestinal obstruction preparatory to making a fourth attempt to close the opening into the colon. A band of omentum was found passing loosely over the lower part of the sigmoid flexure of the colon and adherent to the front wall of the pelvic cavity. This band was ligatured at both ends and removed. After this operation the patient had scarcely any vomiting from the anæsthetic. In December, 1893, a fourth attempt was made to close the opening into the colon. No vomiting was caused by the anæsthetic, and the opening into the colon had remained closed since the operation. The bowels now acted regularly *per rectum*. Menstruation, which had always been more or less irregular and painful, was now quite regular.

Mr. Swinford Edwards, after congratulating the operator on the successful issue of the case, asked what was the nature of the earlier unsuccessful attempts to close the colotomy wound; whether the same course was adopted as in the last successful attempt.

Mr. Goodsall, in reply, said that the first time he pared the edges widely and then closed with sutures; the second time he again closed with sutures, and held the edges together with harelip pins, but they nearly cut out, and had to be removed; the third time he applied strapping, but this did not hold; the fourth and last time the colon was almost freed from its adhesions to the abdominal wall. The opening into the colon was then closed by Lembert's sutures, and that in the abdominal parietes was closed by interrupted sutures.

A MODIFIED THIERSCH-GOULD OPERATION (ABLATION OF MALE GENITALS).

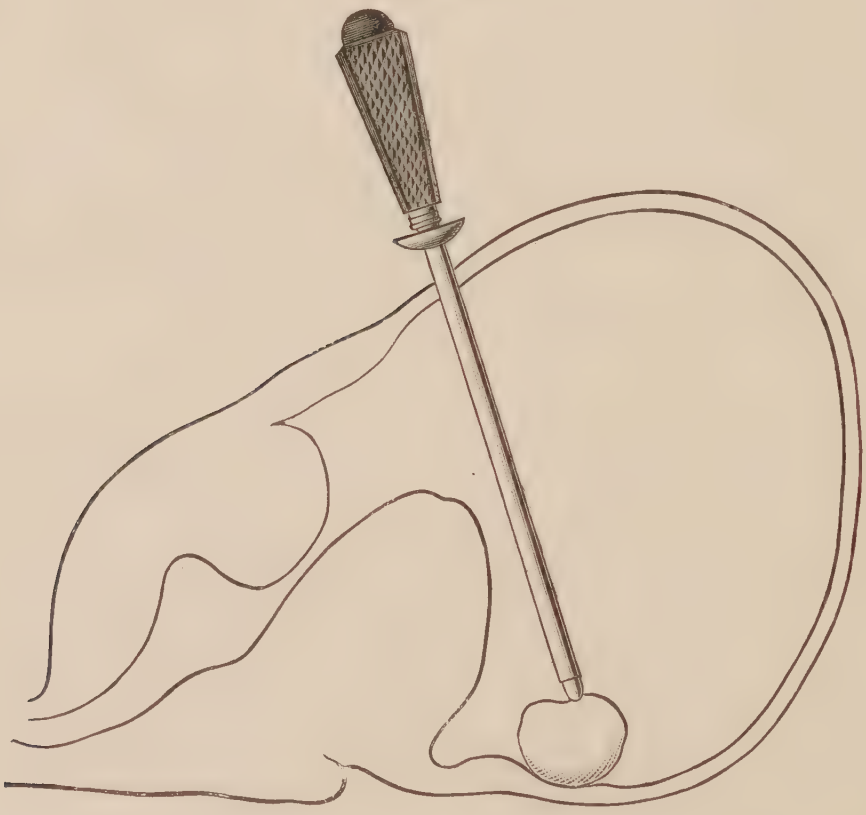
By E. Hurry Fenwick, F.R.C.S.

Mr. Hurry Fenwick showed a man, aged 39, on whom he had effected the removal of the testicles, scrotum and penile structures, down to the perineum, by a modified Thiersch-Gould operation, on account of rapidly infiltrating epithelioma of the corpora cavernosa, commencing in the gland penis. The patient had formerly suffered from congenital phymosis, but had been circumcised 11 years previous to the onset of the malignant growth. The wound had

healed by primary union, and the man was now in good health and able to retain his water for four hours at a time.

Mr. Hurry Fenwick drew attention to the difficulties in sounding for stone in certain cases of much enlarged or of irregularly enlarged prostate. He pointed out that calculi were sometimes so deeply placed behind and below an upraised median lobe or prostatic collar, that the sound introduced *per urethram* could not reach them, however much it was rotated, and however forcibly it was thrust towards the base over the lobe. Moreover, harmful pressure was often exercised in this manœuvre upon the prostate, and cystopyelitis and hæmorrhage were apt to result. He suggested that whenever the prostate was very large, or whenever it was difficult to traverse, or if it bled easily, that an aspirator-trocar and cannula should be thrust suprapubically into the fully-distended *cleansed* bladder, the trocar replaced by a loosely-fitting blunt pilot, and the post-prostatic pouch and bladder base carefully prodded with the latter (Fig. 1), to ascertain the absence or the

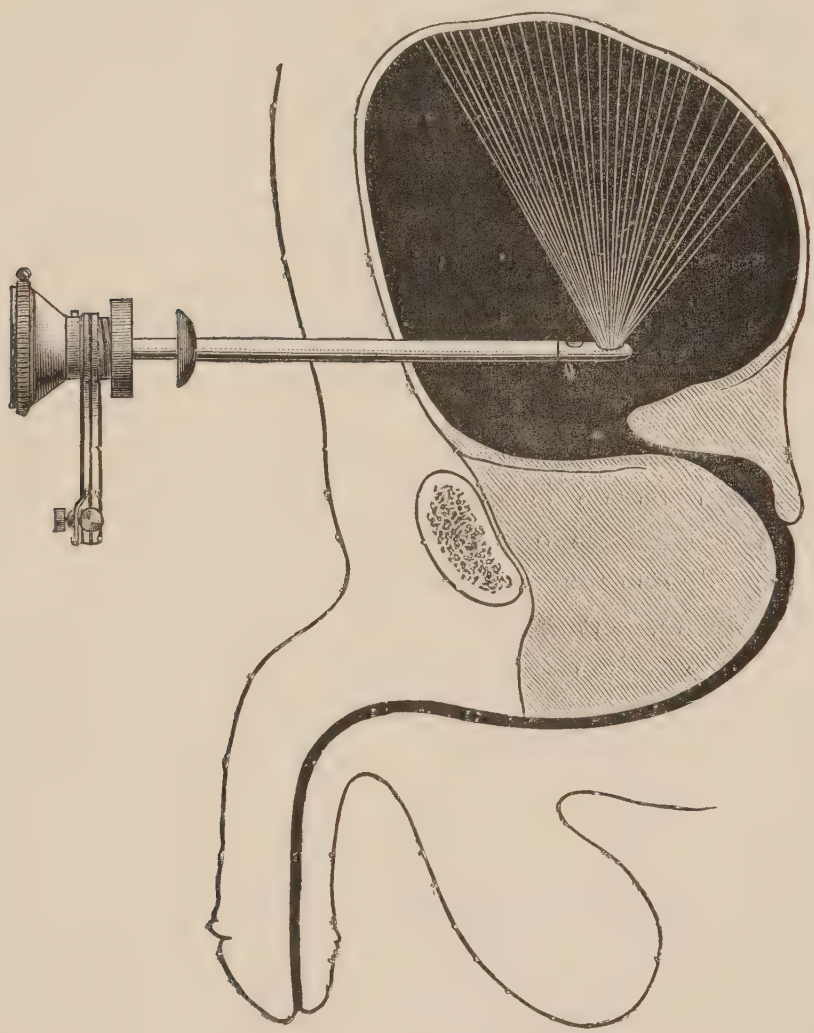
Fig. 1.



presence of stone without incurring the risks incidental to urethral sounding. If it had been determined to drain the bladder supra-

pubically, a larger trocar and cannula could be employed, and through the latter a straight electric cystoscope, which he had devised, could be introduced into the washed-out bladder, and the interior examined (Fig. 2). He advised the latter procedure in

FIG. 2.



cases of much enlarged prostate in which a suspicion of benign growth existed, for in these cases the ordinary cystoscope could not be used. If a stone of benign growth were discovered, a director could be passed through the cannula, the latter withdrawn over the director, and the bladder opened by a limited incision on the director. The disease could then be dealt with and the bladder drained. He submitted that this method of sounding and cystoscoping the bladder in irregular prostates would save exploratory suprapubic cystotomy, which was a severe procedure in old age, and one not to be undertaken lightly.

PAPILLOMATOUS GROWTHS OF URETHRA.

By E. Hurry Fenwick, F.R.C.S.

Mr. Fenwick also showed some two dozen papillomatous growths which had been removed from a man who had suffered from obstinate gleet. Their presence had been diagnosed by means of the electric urethroscope, and they had then been scraped away through the cannula, and their bases cauterised under control of the electric light.

CASE OF PARALYSIS OF STERNO-MASTOID, TRAPEZIUS, AND FACE ON ONE SIDE.

By Lewis Jones, M.D.

Dr. Lewis Jones showed a young married woman, aged 19, suffering from paralysis of the sterno-mastoid and trapezius, together with paralysis of the same side of the face and deafness of that ear. The soft palate was not affected. The history of the onset was vague, but it seemed to have been gradual, and to have commenced about 15 months ago. It was accompanied by pain in the shoulder. He pointed out that the association of paralysis of the seventh cranial nerve with paralysis of the spinal accessory was unusual.

The President endeavoured to elicit from the patient further details of the onset of the malady, and the patient stated that it had come on suddenly, that is to say, she had woke up one morning with the symptoms, though in good health on the previous day. The President insisted on the necessity for a clearer history of the onset, and suggested that it might be possible to obtain supplementary details from the relatives, and, with this object in view, he suggested that she should be kept under observation.

Dr. Beevor observed that the author's case differed from those usually met with, in that neither the tongue nor the soft palate were involved. He suggested that in all probability the lesions were alongside, though not within, the medulla pressing on the facial and auditory nerves and lower down on the spinal accessory. Another point of interest was the fact that though the spinal accessory was affected, the accessory to the vagus was exempt, as evidenced by the fact that though the sterno-mastoid and trapezius were affected, the soft palate, which had been experimentally shown by Professor Horsley and himself to be innervated by the accessory to the vagus, has escaped. It was also somewhat remarkable that the hypoglossal was not involved.

Dr Guthrie asked whether the chorda tympani was involved. He

thought that a single lesion towards the posterior part of the petrous bone, extending down towards the foramen magnum, would account for the symptoms. He suggested that the lesion was possibly of the nature of a bone inflammation, and the occurrence of pain was in favour of this view.

ELECTROLYSIS IN NÆVUS.

By Lewis Jones, M.D.

Dr. Lewis Jones also showed a lad with a nævus of the cheek which he was treating by means of electrolysis, using a fine platinum needle, and inserting the negative pole, taking care to distribute the punctures over the surface in order to avoid scarring. The nævus was almost obliterated, and the remaining traces would be got rid of in the same way. The current used was from 3 to 4 milliampères; the punctures had not given rise to much pain or irritation, and the patient's appearance was very greatly improved.

CASE OF OSTEITIS DEFORMANS.

By Leonard G. Guthrie, M.A., M.D.

Dr. Guthrie showed a woman, aged 62, who was the subject of osteitis deformans. Twelve years ago she had injured her right thigh whilst entering a railway carriage, causing a swelling and large bruise to appear. From this time she had more or less constant pain in the thigh of a shooting, aching character, going up into the right side of the abdomen and down into the leg. She was not certain that the pain had not preceded the injury, but was positive that it had been much worse ever since. Six years later the front of both legs below the knees became tender and painful, and at about the same time the limbs began to bend in the following order: (1) right thigh, (2) left leg below the knee, and (3) right leg below the knee. Three years ago pains began in the right arm and forearm, but no swelling or deformity had resulted. Recently she had commenced to stoop from the onset of upper dorsal curvature. Her pains were increased at night, much disturbing her rest, and also were increased by walking. She suffered much from cramps in the gastrocnemii of both legs. She had been delicate as a child, but had had no severe illness since childhood. She had never had syphilis, acute rheumatism, or acute gout; but

her pains had been regarded as rheumatic for many years, and the distal phalanges of the fingers in both hands were nodular. She had had three children, two of whom were alive and healthy; one sister was alive and healthy; an aunt had been bedridden for many years with rheumatism. There was no family history of cancer or any indication of cancer in the patient; there was no family history of osteitis deformans. Her present condition was as follows. The cranial and facial bones were unaffected. The thorax was somewhat flattened and square in front; expansion was fair. There was no fixation or thickening of the ribs. There was an antero-posterior curvature of the dorsal spine. The left clavicle was delicate and of normal shape, the right somewhat thickened. The bones of the arms and forearms were thin and delicate, the hands and feet small. The distal phalanges of the fingers showed Heberden's nodes. The pelvis was flattened from before backwards and widened laterally, the anterior superior iliac spines being $11\frac{1}{2}$ inches apart. The lower extremities were bowed outwards in the form of a hoop. She could not bring her knees within $5\frac{1}{2}$ inches of each other without crossing her feet. The right femur was much thickened and curved outwards and forwards. The left femur was little, if at all, affected. Both tibiæ were much thickened and felt nodular, and were curved outwards and forwards, particularly the left. The right leg was nearly an inch shorter than the left. On walking she was compelled to turn the right foot out in order to avoid tripping over the left. The chief point of interest in the case was the absence of affection of the cranial bones and of the clavicles. The patient attributed her illness to the injury received 12 years ago, and if this were so the case afforded strong evidence of the infective character of the disease, which would thus be analogous to the more acute and dangerous inflammations of bones which occasionally followed injury to a single bone in younger subjects.

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